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ABSTRACT

This manual is intended to provide educators with information and guidelines for locating, selecting, and purchasing commercially available courseware for the Apple II microcomputer. A courseware index is provided which lists programs in broad subject areas and grade levels. Information given for each program includes its DOS, language, cost, publisher, and distributor, as well as a short description. This index can be used to locate commercially available programs in a particular subject area and for a specific grade level. Catalogs from 63 publishers and producers of microcomputer courseware are included, as well as an alphabetized list of the addresses of more than 200 publishers, distributors, and manufacturers of computer products. An annotated bibliography of microcomputer journals, magazines, and newsletters provides descriptions of the publications, the addresses and yearly subscription rates, and comments on the general usefulness of the publications. A list of selected compatible accessories and expansion options for the Apple II is also provided. (Author/LLS)

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JEM
RESEARCH

Joint Educational
Management Research

REFERENCE MANUAL
for the
INSTRUCTIONAL USE OF MICROCOMPUTERS

Volume I
(Release II)

by

Denyse Forman
Stuart Crawford
Ross Tennant

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W. Tennant

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PREFACE

The purpose of this manual is to provide educators with information and guidelines for locating, selecting, and purchasing commercially available courseware for the Apple II* microcomputer.

The manual contains the following sections:

Section I ... an annotated courseware index
Section II ... catalogue reproductions
Section III... a list of publishers and distributors
Section IV ... courseware descriptors
Section V ... an annotated list of computer books
Section VI ... an annotated list of computer magazines and journals
Section VII... an annotated list of compatible expansion options and accessories

In Section I, the courseware index, programs are listed; the DOS, language, cost, publisher and distributor are provided; they are assigned to broad subject areas and grade levels; and short descriptions are included.

The index can be used to locate commercially available programs in a particular subject area and for a specific grade level. The information which accompanies each program enables the user to determine which programs are appropriate and within budget. A computerized index developed using the Data Factory is also available from JEM Research.

Wherever possible, more detailed descriptions of programs have been provided in Section II, the catalogue reproduction section. Each company represented in this section has information and products of value and interest to the education market and has made its catalogue of material available to JEM.

Section III contains an alphabetized list of the complete addresses of over two hundred publishers, distributors and manufacturers of computer products.

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*Apple is a registered trademark of Apple Computer Inc.

JEM has endeavoured to obtain at least one program from each of the publishers represented in the catalogue reproduction section in order to determine the general quality of the company's product while at the same time providing more detailed information about particular programs.

Descriptions or evaluations of these programs have been included in Section IV, the courseware descriptors section. In most cases the program is described as though the educator were actually previewing it. Subjective comments have been included only when a program blatantly fails to meet minimum criteria. However, whenever a program has been thoroughly lab and field tested by a qualified and experienced educator, a detailed evaluation has been included.

Section V provides an annotated bibliography of microcomputer journals, magazines, and newsletters which was developed by Ron Adams of the College of New Caledonia. The publication is described, the address and yearly subscription rate are given, and a comment is made on the general usefulness of the publication.

The final section provides a list of selected compatible accessories and expansion options for the Apple II. Such peripherals as graphics tablets, printers, music synthesizers, speech input and output devices, network systems, and various firmware options are described.

Any comments or suggestions as to how the manual might be improved would be appreciated. JEM would like to thank the companies who sent their catalogues and programs and apologize for any errors or omissions that might have occurred in producing the manual

MAGIC WINDOW
ADMINISTRATIVE AIDS/BUSINESS EDUCATION
TEACHER
ARTSCI INC.
ARTSCI INC.

3.2/3.3
THIS IS A WORD PROCESSOR/TEXT EDITOR THAT ENABLES THE USER TO WRITE.REVISE.EDIT AND PRINT ALL TYPES OF WRITTEN MATERIAL.

THE CLASS SCHEDULING PROGRAM
ADMINISTRATIVE AIDS
TEACHER
CHARLES MANN AND ASSOCIATES
CHARLES MANN AND ASSOCIATES
$25.00
3.2
THIS ALLOWS THE USER TO PREFORM A NUMBER OF THE FUNCTIONS INVOLVED IN CLASS SHEDULING (INCLUDING COURSES AVAILABLE).

GRADING SYSTEMS PROGRAMS 1
ADMINISTRATIVE AIDS
TEACHER
CHARLES MANN AND ASSOCIATES
CHARLES MANN AND ASSOCIATES
$199.95
3.2
HELPS TEACHERS AND ADMINISTRATORS KEEP TRACK OF GRADES.CUMULATIVE AVERAGES AND SCHOOL CREDITS.

GRADING SYSTEMS PROGRAMS II
ADMINISTRATIVE AIDS
TEACHER
CHARLES MANN AND ASSOCIATES
CHARLES MANN AND ASSOCIATES
$249.95
3.2
THIS PROGRAM IS A COMBINATION OF THE "GRADING SYSTEMS PROGRAM 1" AND A LIGHT PEN WHICH MINIMIZES TEACHER KEYBOARD ENTRY.

PERSONAL TEXT PROCESSOR
ADMINISTRATIVE AIDS
TEACHER
CHARLES MANN AND ASSOCIATES
CHARLES MANN AND ASSOCIATES
$65.95
3.2
THIS PROGRAM AIDS THE SCHOOL'S SECRETARY IN PREPARING THE SCHOOL CORRESPONDENCE.

IMMUNIZATION PACKAGE
ADMINISTRATIVE AIDS
TEACHER
DATA PROCESSING CONSULTANTS
DATA PROCESSING CONSULTANTS
N/A
3.2
RETAINS PERSONAL DATA ON ALL STUDENTS AS WELL AS DATES AND STATUS FOR UP TO SIX IMMUNIZATIONS.CALCULATES NEXT DATE FOR SHOT AND PRINTS A REPORT.

CATALOG WRITER
BUSINESS EDUCATION ADMINISTRATIVE AIDS
JUNIOR/SENIOR TEACHER
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$19.95
3.2
THIS IS A WORD PROCESSING SYSTEM DESIGNED TO PRODUCE A DESCRIPTIVE CATALOGUE.

ASSISTANT PRINCIPAL
ADMINISTRATIVE AIDS
TEACHER
MONUMENT COMPUTER SERVICE
MONUMENT COMPUTER SERVICE
$500.00
3.2/AS
THIS PACKAGE PROVIDES TOTAL CONTROL OF CLASS ROSTERS,STUDENT MASTER RECORDS.STUDENT SCHEDULES.TEACHER ASSIGNMENTS.AND GRADE REPORTING.

GRADE SYSTEM
TEACHER AIDS ADMINISTRATIVE AIDS
TEACHER

BELL & HOWELL
$450.00
3.2/AS
THIS IS A COMPREHENSIVE GRADING SYSTEM THAT ALLOWS GRADES TO BE KEPT AND STORED FOR UP TO 600 STUDENTS ON ONE DISKETTE.

REGISTRAR
ADMINISTRATIVE AIDS
TEACHER
OMNICO
OMNICO
$650.00
3.2/
THIS IS A COMPLEX REGISTRATION SYSTEM FOR HIGH-SCHOOLS.

THE ADMINISTRATORS' APPLE PACKAGE
ADMINISTRATIVE AIDS
TEACHER
DENIS J. SIMAIR
JEM RESEARCH
$500.00
3.2/3.3
THE PACKAGE CONSISTS OF ATTENDANCE.DEMOGRAPHIC AND TEXTBOOK SYSTEMS. THE PACKAGE HAS A WORD PROCESSING CAPABILITY WHICH ALLOWS FOR PERSONALIZED ATTENDANCE LETTERS TO PARENTS.

LET'S MAKE A DESIGN
ART
ELEMENTARY JUNIOR/SENIOR
EDUTEK
EDUTEK
$19.50
3.2/
THIS PROGRAM ALLOWS THE STUDENT TO USE THE SCREEN TO MAKE A DESIGN IN 16 DIFFERENT COLORS USING THE GAME PADDLES.

ELECTRIC CRAYON
ART
ELEMENTARY JUNIOR
MUSE SOFTWARE
MUSE SOFTWARE
$17.95
3.2/AS
THIS PROGRAM USES 15 COLORS OF LOW RESOLUTION GRAPHICS TO ENABLE THE STUDENT TO CREATE ART SIMILAR TO A MOVING NEON SIGN

DRAWING BOARD/KAL
ART
JUNIOR/SENIOR
PROGRAMMER INTERNATIONAL INC.
PROGRAMMER INTERNATIONAL INC.
$9.95
3.2/AS
THIS IS A COMPUTER DRAWING BOARD THAT STUDENTS CAN STORE AND RETRIEVE INFORMATION ON.

MAGIC WINDOW
ADMINISTRATIVE AIDS/BUSINESS EDUCATION
TEACHER
ARTSCI INC.
ARTSCI INC.

3.2/3.3
THIS IS A WORD PROCESSOR/TEXT EDITOR THAT ENABLES THE USER TO WRITE,REVISE,EDIT AND PRINT ALL TYPES OF WRITTEN MATERIAL.

THE CONTROLLER
BUSINESS EDUCATION
TEACHER
APPLE COMPUTER INC.
LOCAL DEALER

3.2
THIS IS A COMPREHENSIVE ACCOUNTING SYSTEM.

PERSONAL EXPENSE RECORD
BUSINESS EDUCATION
JUNIOR/SENIOR
WISE OWL WORKSHOP
WISE OWL WORKSHOP
$12.00
3.2
THIS PROGRAM GIVES STUDENTS PRACTICE IN PLANNING A PERSONAL BUDGET OR HOUSEHOLD RECORD PLAN.

MICROTYPING
BUSINESS EDUCATION
JUNIOR/SENIOR
HAYDEN BOOK COMPANY INC.
HAYDEN BOOK COMPANY INC.
$10.95
3.2
FEATURES THE TOUCH METHOD OF LEARNING TO TYPE.

MICROSOFT'S TYPING TUTOR
BUSINESS EDUCATION
JUNIOR/SENIOR
MICROSOFT
MICROSOFT

3.2
THIS PROGRAM TEACHES THE BASICS OF TYPING THROUGH INSTRUCTION AND DRILL.

CATALOG WRITER
BUSINESS EDUCATION ADMINISTRATIVE AIDS
JUNIOR/SENIOR TEACHER
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$19.95
3.2
THIS IS A WORD PROCESSING SYSTEM DESIGNED TO PRODUCE A DESCRIPTIVE CATALOGUE.

TYPING
BUSINESS EDUCATION
JUNIOR/SENIOR COLLEGE
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$14.95

THIS IS A SERIES OF PROGRAMS WHICH TEACH THE BASICS OF TYPING.

MIICAS--VOLUME 1
BUSINESS EDUCATION
JUNIOR/SENIOR
MECC SOFTWARE
MECC SOFTWARE(IN B.C. FROM JEM RESEARCH)
$15.00
3.2
THIS PROGRAM PROVIDES PRACTICE IN ACCOUNTING THROUGH THE USE OF SIMULATION.

TYPEMASTER
BUSINESS EDUCATION
JUNIOR/SENIOR COLLEGE
M.D. FULLMER AND ASSOCIATES
M.D. FULLMER AND ASSOCIATES(IN B.C. FROM JEM RESEARCH)
$100.00
3.2
THIS PROGRAM ASSISTS ALL LEVELS OF TYPISTS IN IMPROVING AND
MAINTAINING THEIR TYPING SKILLS.

ADVERTISING TECHNIQUES
BUSINESS EDUCATION
JUNIOR/SENIOR COLLEGE

BELL & HOWELL
$31.50
3.2/AS
THIS PROGRAM PRESENTS THE FOUR MAJOR TYPES OF ADVERTISING AND
INTERACTS WITH THE STUDENT TO LEARN THEM.

VISICALC
BUSINESS EDUCATION
TEACHER

BELL & HOWELL
$215.00
3.2/AS
THIS IS AN ELECTRONIC WORKSHEET.

INCOME MEETS EXPENSES
BUSINESS EDUCATION
JUNIOR/SENIOR COLLEGE
MCE PROGRAMS
MCE PROGRAMS
$340.00
3.2/AS
THIS PROGRAM INTRODUCES STUDENTS TO THE CONCEPT OF BUDGETING.

YOU CAN BANK ON IT
BUSINESS EDUCATION
JUNIOR/SENIOR COLLEGE
MCE PROGRAMS
MCE PROGRAMS
$285.00
3.2/AS
THIS PROGRAM INTRODUCES AND COVERS MANY CONCEPTS OF THE BANK.

MONEY MANAGEMENT ASSESSMENT SERIES
BUSINESS EDUCATION
JUNIOR/SENIOR COLLEGE
MCE PROGRAMS
MCE PROGRAMS
$165.00
3.2/AS
THIS PROGRAM ASSESSES THE BASIC SKILLS NEEDED TO LEARN MONEY MANAGEMENT CONCEPTS AND SKILLS.

JOB READINESS-ASSESSMENT AND DEVELOPMENT
BUSINESS EDUCATION COUNSELLING AIDS
JUNIOR/SENIOR COLLEGE
MCE PROGRAMS
MCE PROGRAMS
$165.00
3.2/AS
THIS PROGRAM CAN BE USED TO ASSESS THE JOB READINESS OF AN INDIVIDUAL.

TOUCH TYPING TUTOR
BUSINESS EDUCATION
JUNIOR/SENIOR
PROGRESSIVE SOFTWARE
PROGRESSIVE SOFTWARE
$19.95
3.2
INDICATES SPEED AND ERRORS MADE WHILE TYPING.

APPLESOFT AND INTEGER BASIC
COMPUTER SCIENCE
TEACHER
BELL AND HOWELL
BELL AND HOWELL

3.2
THIS PROGRAM TEACHES THE USER TO PROGRAM IN BOTH APPLESOFT AND INTEGER BASIC.

THE TEACHER PLUS
COMPUTER SCIENCE
JUNIOR/SENIOR (COLLEGE)
CHARLES MANN AND ASSOCIATES
CHARLES MANN AND ASSOCIATES
$39.95
3.2
THIS PROGRAM IS DESIGNED TO TEACH THE STUDENT THE FUNDAMENTALS OF THE OPERATING AND COMMAND SYSTEM FOR BASIC PROGRAMMING IN APPLESOFT.

TEACHER PLUS PAC
COMPUTER SCIENCE
JUNIOR/SENIOR (COLLEGE)
CHARLES MANN AND ASSOCIATES
CHARLES MANN AND ASSOCIATES
$69.95
3.2
THIS IS A SPECIAL PRICED TWIN PACKAGE CONSISTING OF THE "TEACHER PLUS" AND THE "FLOATING POINT DICTIONARY".

THE BASIC TEACHER
COMPUTER SCIENCE
JUNIOR/SENIOR (COLLEGE)
CHARLES MANN AND ASSOCIATES
CHARLES MANN AND ASSOCIATES
$34.95
3.2
THIS PROGRAM IS DESIGNED FOR THE NOVICE COMPUTER PROGRAMMER. IT HELPS THE STUDENT TO LEARN THE BASIC LANGUAGE.

THE BASIC TEACHING PAC
COMPUTER SCIENCE
JUNIOR/SENIOR (COLLEGE)
CHARLES MANN AND ASSOCIATES
CHARLES MANN AND ASSOCIATES
$59.95
3.2
THIS IS A DOUBLE DISK PACKAGE WHICH CONTAINS THE TEACHING PROGRAMS FOR BOTH THE APPLE BASIC LANGUAGES.

FLOATING POINT DICTIONARY
COMPUTER SCIENCE
JUNIOR/SENIOR (COLLEGE)
CHARLES MANN AND ASSOCIATES
CHARLES MANN AND ASSOCIATES
$29.95
3.2
THIS IS A COMPLIMENTARY PROGRAM TO THE "BASIC TEACHER" AND THE "TEACHER PLUS" WHICH HELPS THE COMPUTER PROGRAMMING STUDENT LEARN APPLE'S PROGRAMMING LANGUAGES.

INTRODUCTION TO MICROCOMPUTERS
COMPUTER SCIENCE
JUNIOR/SENIOR
MENTOR SOFTWARE INC.
MENTOR SOFTWARE INC.
$54.95
3.2
THIS IS DESIGNED TO AID STUDENTS IN AQUIRING BASIC KNOWLEDGE AND SKILLS WITH MICROCOMPUTERS.

ICOPI
COMPUTER SCIENCE
JUNIOR/SENIOR COLLEGE
MICROPI
MICROPI
$100.00
3.2
THIS IS A CAI COURSE IN COMMON PILOT WHICH TEACHES ABOUT PROGRAMMING IN COMMON PILOT.

STEP BY STEP
COMPUTER SCIENCE
JUNIOR/SENIOR COLLEGE
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$59.95
3.2/AS
THIS IS A COURSE IN BEGINNING PROGRAMMING THAT COVERS MANY OF THE BASICS.

THE COUNSELLOR'S PROGRAM
COUNSELLING
TEACHER
CHARLES MANN AND ASSOCIATES
CHARLES MANN AND ASSOCIATES
$89.95
3.2
THE GUIDANCE COUNSELLOR CAN EASILY PREPARE MASTER STUDENT RECORDS AND FILE FOLDER LABELS.

VITAFACTS (DRINKING/DRUGS)
SCIENCE, COUNSELLING AIDS
JUNIOR/SENIOR
PERSONAL SOFTWARE INC.
PERSONAL SOFTWARE INC.
$19.95
3.2
THIS PROGRAM ASSISTS THE STUDENT IN MAKING DECISIONS REGARDING DRINKING AND DRUGS AND SUGGESTIONS FOR MAKING RESPONSIBLE DECISIONS.

VITAFACTS (SEX)
SCIENCE, COUNSELLING AIDS
JUNIOR/SENIOR
PERSONAL SOFTWARE INC.
PERSONAL SOFTWARE INC.
$19.95
3.2
THIS PROGRAM IS BASICALLY A PANEL DISCUSSION BETWEEN TWO OF CANADA'S FOREMOST SEX COUNSELLORS.

VITAFACTS (HEART ATTACKS)
SCIENCE, COUNSELLING AIDS
JUNIOR/SENIOR
PERSONAL SOFTWARE INC.
PERSONAL SOFTWARE INC.
$19.95
3.2
THIS COURSE ALLOWS THE USER TO BECOME FAMILIAR WITH MANY OF THE FACTS ABOUT HEART ATTACKS AND MANY OF THE PREVENTATIVE MEASURES THAT CAN BE TAKEN.

VITAFACTS (BLOOD PRESSURE)
SCIENCE, COUNSELLING AIDS
JUNIOR/SENIOR (COLLEGE)
PERSONAL SOFTWARE INC.
PERSONAL SOFTWARE INC.
$19.95
3.2
THIS PROGRAM DISCUSSES A NUMBER OF FACTS REGARDING HIGH BLOOD PRESSURE (HYPERTENSION) INCLUDING DEFINITIONS,CAUSES AND TREATMENTS.

VITAFACTS (GROWING UP)
SCIENCE, COUNSELLING AIDS
JUNIOR/SENIOR (COLLEGE)
PERSONAL SOFTWARE INC.
PERSONAL SOFTWARE INC.
$19.95
3.2
THIS PROGRARM DISCUSSES MANY OF THE FAACTORS ENCOUNTERED IN THE CHANGES OF ADOLESCENCE.STUDENTS LEARN ABOUT PHYSICAL AND AND EMOTIONAL CHANGES.

VITAFACTS (BIRTH CONTROL)
SCIENCE,COUNSELLING AIDS
JUNIOR/SENIOR (COLLEGE)
PERSONAL SOFTWARE INC.
PERSONAL SOFTWARE INC.
$19.95
3.2
THIS PROGRAM EXPLAINS THE PROCESS OF CONCEPTION AND THE BIRTH CONTROL METHODS AVAILABLE AND THE EFFECTIVENESS.

SCORING AND MANAGEMENT SYSTEM
TEACHER AIDS COUNSELLOR AIDS
TEACHER
AMERICAN GUIDANCE SERVICE
AMERICAN GUIDANCE SERVICE

3.2/ASB
THIS SYSTEM IS DESIGNED TO HANDLE ALL OF THE FIGURING,PLOTTING,TABLE ACCESSING AND RECORD KEEPING ASSOCIATED WITH THE "WOODCOCK READING MASTERY TESTS".

ALCOHOL
COUNSELLING AIDS
JUNIOR/SENIOR COLLEGE
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$19.95
3.2/IB
THIS PROGRAM DISCUSSES THE EFFECTS OF ALCOHOL ON THE BODY BASED ON INFORMATION SUPPLIED BY THE USER.

A MEMORY MYTH
COUNSELLING AIDS
ELEMENTARY JUNIOR/SENIOR COLLEGE

BELL & HOWELL
$24.95
3.2/AS
THIS IS A MEMORY IMPROVING DEVICE.

COLLEGE BOARDS
COUNSELLING AIDS
SENIOR COLLEGE
KRELL SOFTWARE
KRELL SOFTWARE
$79.95
3.2/
THIS IS DESIGNED TO SHARPEN THE SKILLS OF THOSE TAKING THE COLLEGE BOARD EXAMS.

COLLEGE BOARDS (SPECIAL EDUCATOR EDITION)
COUNSELLING AIDS
SENIOR COLLEGE
KRELL SOFTWARE
KRELL SOFTWARE
$149.95
3.2/
THIS INCLUDES PROGRAMS OF THE COLLEGE BOARD EXAMS AS WELL AS DETAILED SOLUTIONS AND DRILL EXERCISES.

GRADUATE RECORD EXAMS
COUNSELLING AIDS
SENIOR COLLEGE
KRELL SOFTWARE
KRELL SOFTWARE
$139.95
3.2
ACTUAL RECORD EXAMS ARE USED TO SHARPEN SKILLS FOR THE EXAMS.

EDUCATOR GRADUATE RECORD EXAMS
COUNSELLING AIDS
SENIOR COLLEGE
KRELL SOFTWARE
KRELL SOFTWARE
$199.95
3.2/
THESE ARE THE GRADUATE RECORD EXAMS WITH DETAILED SOLUTIONS TO THE PROBLEMS AND EXPLANATIONS.

HOME SAFE HOME
COUNSELLING AIDS
JUNIOR/SENIOR COLLEGE
MCE PROGRAMS
MCE PROGRAMS
$165.00
3.2/AS
THIS IS AN INFORMATIVE SAFETY PROGRAM FOR THE HOME.

JOB READINESS-ASSESSMENT AND DEVELOPMENT
BUSINESS EDUCATION COUNSELLING AIDS
JUNIOR/SENIOR COLLEGE
MCE PROGRAMS
MCE PROGRAMS
$165.00
3.2/AS
THIS PROGRAM CAN BE USED TO ASSESS THE JOB READINESS OF AN INDIVIDUAL.

APPLE FLASH
COUNSELLING AIDS
TEACHER
OMNICO
OMNICO
$110.00
3.2/
THIS PROGRAM TESTS THE PERCEPTUAL ACCURACY OF STUDENTS.

HUMAN FEMALE REPRODUCTIVE CYCLES
SCIENCE COUNSELLING AIDS
ELEMENTARY JUNIOR/SENIOR
COMPRESS
COMPRESS
$50.00
3.2/AS
CONTAINS:SELF-GENERATION,INDUCED OR ANNUAL,FERTILE,INFERTILE AND SUPPRESSED.

BASIC ELECTRICITY
ELECTRONICS
JUNIOR
IDEATECH
IDEATECH
$12.95
3.2
CONTAINS:CURRENT FLOW,OPEN AND CLOSED CIRCUITS,AND LOGICAL THINKING.THE STUDENT MUST SOLVE A CIRCUIT PUZZLE AT THE END.

FREQOUT
SCIENCE/ELECTRONICS
(COLLEGE)
MICROPRODUCTS
MICROPRODUCTS
$49.95
3.2 OR 3.3
THIS PROGRAM TURNS THE COMPUTER INTO A POWERFUL SIGNAL ANALYSIS TOOL.

SERIES CIRCUIT ANALYSIS
ELECTRONICS
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE ANALYSIS OF A SERIES CIRCUIT CONSISTING OF THREE RESISTORS AND A BATTERY.

PARALLEL CIRCUIT ANALYSIS I
ELECTRONICS
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE ANALYSIS OF A PARALLEL CIRCUIT CONTAINING THREE RESISTORS AND A BATTERY.

PARALLEL CIRCUIT ANALYSIS II
ELECTRONICS
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE ANALYSIS OF A PARALLEL CIRCUIT CONSISTING OF THREE RESISTORS AND A BATTERY.CONTAINS:CONCEPTS OF RESISTANCE, POTENTIAL RESISTANCE,AND OHM'S LAW.

SERIES PARALLEL CIRCUIT ANALYSIS
ELECTRONICS
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE ANALYSIS OF A CIRCUIT IN WHICH A SINGLE RESISTOR IS IN SERIES WITH A PARALLEL COMBINATION OF TWO RESISTORS.

FRENCH I
FOREIGN LANGUAGES
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

FRENCH II
FOREIGN LANGUAGES
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

SPANISH I
FOREIGN LANGUAGES
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

SPANISH II
FOREIGN LANGUAGES
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

GERMAN I
FOREIGN LANGUAGES
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

GERMAN II
FOREIGN LANGUAGES
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

ASTRO WORD SEARCH:SPANISH
FOREIGN LANGUAGES
SENIOR COLLEGE
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$23.95
3.2/AS
THE COMPUTER GENERATES HUNDREDS OF HIDDEN WORD PUZZLES IN
SPANISH WHICH THE STUDENT MUST SOLVE.

ASTRO WORD SEARCH:FRENCH
FOREIGN LANGUAGES
SENIOR COLLEGE
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$23.95
3.2/AS
THE COMPUTER GENERATES HUNDREDS OF HIDDEN WORDS IN FRENCH
WHICH THE STUDENT MUST SOLVE.

PRACTICANDO ESPANOL CON LA MANZANA II
FOREIGN LANGUAGES LANGUAGE ARTS
JUNIOR/SENIOR COLLEGE
CONDUIT
CONDUIT
$100.00
3.2/IB
THIS IS A COMPUTER ASSISTED LANGUAGE ARTS LESSON IN SPANISH.

GEOGRAPHY TERMS/CAPITALS OF THE U.S.
GEOGRAPHY
ELEMENTARY JUNIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

ELEMENTARY-VOLUME 6
SOCIAL STUDIES GEOGRAPHY
ELEMENTARY
MECC SOFTWARE
MECC SOFTWARE(IN B.C. FROM JEM RESEARCH)
$15.00
3.2
THIS PROGRAM SIMULATES A VARIETY OF HISTORICAL SITUATIONS AS WELL AS TEACHING MAP READING.

ASTRO WORD SEARCH:GEOGRAPHY
GEOGRAPHY
JUNIOR/SENIOR COLLEGE
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$23.95
3.2/AS
SEARCH FOR HIDDEN GEOGRAPHICAL PLACE NAMES IN A PATTERN OF LETTERS GENERATED BY THE COMPUTER.

MAP READING
GEOGRAPHY
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$24.95
3.2/AS
THE BASIC PROGRAM COVERS:THE COMPASS,THE CONCEPT OF SCALE,AND NOTATION.

UNCLE SAM'S JIGSAW
GEOGRAPHY
JUNIOR/SENIOR
MICRO USERS SOFTWARE EXCHANGE
MICRO USERS SOFTWARE EXCHANGE.
$12.95
3.2/
THIS IS AN EDUCATIONAL GEOGRAPHY GAME FEATURING A DETAILED MAP OF THE UNITED STATES.

3-D SURFACE PLOTTER
MATHEMATICS GEOGRAPHY
SENIOR COLLEGE
SPECTRUM SOFTWARE
SPECTRUM SOFTWARE
$19.95
3.2/AS
ANY THREE DIMENSIONAL SURFACE CAN BE PLOTTED FROM ANY THREE VARIABLE EQUATION.

SKILLDRILL #2 - STIMULUS WORD, RESPONSE DISPLAYED
LANGUAGE ARTS
ELEMENTARY JUNIOR
HARTLEY SOFTWARE
HARTLEY SOFTWARE
$92.95
3.2
THIS PROGRAM WILL DRILL THE STUDENT AS WELL AS GIVE LESSONS IN THE USE OF AFFIXES,HOMONYMS,PLURALS,CONTRACTIONS,COMPOUNDS, AND CONFUSED WORDS.

SPELLER BOX
LANGUAGE ARTS
ELEMENTARY
HARTLEY SOFTWARE
HARTLEY SOFTWARE
$49.95
3.2
THIS USES THE GAME PADDLE SOCKET TO CONTROL A CASSETTE TAPE THAT GIVES SPELLING TESTS TO STUDENTS.

VOCAB DRILL #4 - AURAL STIMULUS/VISUAL DISPLAY.
LANGUAGE ARTS
ELEMENTARY
HARTLEY SOFTWARE
HARTLEY SOFTWARE
$64.95
3.2
THIS PROGRAM IS DESIGNED TO QUIZ AND GIVE AURAL FEEDBACK AS TO THE RESULTS.

WORDSEARCH
LANGUAGE ARTS
ELEMENTARY
HARTLEY SOFTWARE
HARTLEY SOFTWARE
$14.95
3.2
THIS COMPUTER PROGRAM WILL PRINT A WORD SEARCH PUZZLE BASED ON THE WORDS ENTERED BY THE USER.ALSO PRINTS AN ANSWER KEY ON REQUEST.

SKILLDRILL #1 - STIMULUS WORD WITH BLANKS
LANGUAGE ARTS
ELEMENTARY JUNIOR
HARTLEY SOFTWARE
HARTLEY SOFTWARE
$136.45
3.2
THIS PROGRAM WILL DRILL THE STUDENT IN SIMPLE SPELLING PLUS PROVIDE A NUMBER OF CONSONANT AND VOWEL LESSONS.

SKILLDRILL #7
LANGUAGE ARTS
ELEMENTARY
HARTLEY SOFTWARE
HARTLEY SOFTWARE
$43.95
3.2
THIS PROGRAM PROVIDES TWO LINES OF VISUAL STIMULUS AND THEN ALLOWS FOR ONE LINE OF RESPONSE FROM THE STUDENT.

SPELLING TEST #3
LANGUAGE ARTS
ELEMENTARY JUNIOR
HARTLEY SOFTWARE
HARTLEY SOFTWARE
$14.95
3.2
THIS USES THE "SPELLER BOX" TO PRESENT SPELLING TESTS TO STUDENTS. THIS IS USEFUL AS A TEST GIVER.

WORD FAMILIES
LANGUAGE ARTS
ELEMENTARY
HARTLEY SOFTWARE
HARTLEY SOFTWARE
$29.95
3.2
THE COMPUTER PRESENTS A STIMULUS WORD WHEREUPON THE STUDENT RESPONDS.THIS IS A PHONOGRAMS EXERCISE.

SKILLDRILL #6
LANGUAGE ARTS
ELEMENTARY
HARTLEY SOFTWARE
HARTLEY SOFTWARE
$74.95
3.2
THIS IS A SPELLING TEST WHERE THE STUDENT RESPONDS TO A VISUAL COMMAND. THE COMPUTER PROVIDES FEEDBACK AND REINFORCEMENT.

LETTER RECOGNITION
LANGUAGE ARTS
ELEMENTARY
HARTLEY SOFTWARE
HARTLEY SOFTWARE
$19.95
3.2
THE STUDENT IS ASKED QUESTIONS REGARDING LETTER RECOGNITION AND IS ASKED TO RESPOND.

SKILLDRILL #5 - STIMULUS AND RESPONSE
LANGUAGE ARTS
ELEMENTARY
HARTLEY SOFTWARE
HARTLEY SOFTWARE
$50.95
3.2
THIS PROGRAM QUESTIONS THE STUDENT WITH TWO LINES AND THEN REQUESTS A SIMPLE RESPONSE.

WORD FLASH
LANGUAGE ARTS
ELEMENTARY
IDEATECH
IDEATECH
$9.95/8.95
3.2
THIS PROGRAM ENABLES THE STUDENT TO INCREASE SPELLING AND MEMORY SKILLS.ALL VARIABLES MAY BE TEACHER REGULATED.

QUESTIONS AND STORY
LANGUAGE ARTS
ELEMENTARY
IDEATECH
IDEATECH
$6.95/5.95
3.2
SEVEN QUESTIONS ARE ASKED OF THE STUDENT AND THE ANSWERS ARE INCORPORATED INTO A STORY.

COLOR GUESS
LANGUAGE ARTS
ELEMENTARY
IDEATECH
IDEATECH
$7.95/6.95
3.2
THIS IS DESIGNED TO TEACH THE PRIMARY GRADES COLOR RECOGNITION AND THE VARIOUS SPELLINGS.

U-SPELL
LANGUAGE ARTS
ELEMENTARY JUNIOR
MENTOR SOFTWARE INC.
MENTOR SOFTWARE INC.
$34.95
3.2
THE STUDENT HEARS THE WORD AND SEES THE CONTEXT SENTENCE ON THE SCREEN AND THEN ANSWERS WITH THE CORRECT RESPONSE.

SPELLING II
LANGUAGE ARTS
ELEMENTARY
MENTOR SOFTWARE INC.
MENTOR SOFTWARE INC.
$59.95
3.2
THIS PROGRAM DRILLS STUDENTS ON SPELLING WITH THE EMPHASIS ON THOSE WORDS WITH IRREGULAR SPELLINGS.

SPELLING I
LANGUAGE ARTS
ELEMENTARY
MENTOR SOFTWARE INC.
MENTOR SOFTWARE INC.
$5[illegible].95
3.2
DRILLS STUDENTS ON SIXTY OF THE MOST COMMON SIGHT WORDS FOUND IN THE PRIMARY READERS.

PRESCHOOL IQ BUILDER
LANGUAGE ARTS
ELEMENTARY
PROGRAM DESIGN INC.
QUEUE
$23.95/14.95
3.2/IB
THIS PROGRAM TEACHES THE NECESSARY COGNITIVE SKILLS.THE CHILD MATCHES A LETTER ON THE MONITOR TO ONE ON THE SCREEN.

READING COMPREHENSION:WHAT'S DIFFERENT?
LANGUAGE ARTS
ELEMENTARY JUNIOR
PROGRAM DESIGN INC.
QUEUE
$19.95/14.95
3.2/IB
THIS PROGRAM PRESENTS LOGICAL PROBLEMS WHERE ONE WORD IN FOUR DOESN'T BELONG WITH THE REST.

SKILL WORDS I:PREFIXES
LANGUAGE ARTS
ELEMENTARY
PROGRAM DESIGN INC.
QUEUE
$19.95/14.95
3.2/IB
STUDENTS LEARN THE MEANINGS OF A GROUP OF PREFIXES.

STORY BUILDER/WORD MASTER
LANGUAGE ARTS
ELEMENTARY JUNIOR
PROGRAM DESIGN INC.
QUEUE
$19.95/14.95
3.2/IB
THIS IS A LOGIC GAME WHERE THE COMPUTER PRESENTS A SERIES OF PARTIALLY COMPLETED SENTENCES THAT THE STUDENT MUST COMPLETE.

MEMORY BUILDER:CONCENTRATION
LANGUAGE ARTS
ELEMENTARY
PROGRAM DESIGN INC.
QUEUE
$19.95/14.95
3.2/IB
A SERIES OF EDUCATIONAL GAMES TO IMPROVE MEMORY,ATTENTION SPAN AND CONCENTRATION.

MOTHER GOOSE RHYMES
LANGUAGE ARTS
ELEMENTARY
GEORGE EARL
QUEUE
$24.95
3.2/IB
OVER 600 SCREEN PAGES ENCOURAGE BEGINNING READERS.

GAME POWER FOR PHONICS
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
WISE OWL WORKSHOP
WISE OWL WORKSHOP
$24.50
3.2
THIS PROGRAM STRESSES INTENSIVE VERBAL REHEARSAL,REINFORCES BASIC SKILLS,INDEPENDANT OR GROUP WORK,AND IS ADAPTABLE TO ALL GRADE LEVELS.

JABBERWOCKY
LANGUAGE ARTS
ELEMENTARY JUNIOR
WISE OWL WORKSHOP
WISE OWL WORKSHOP
$12.00
3.2
THIS IS AN ENGLISH STUDY GAME THAT DRILLS THE STUDENTS ON THE PARTS OF SPEECH.CAN BE PLAYED INDEPENDENTLY OR IN GROUPS.

HANGMAN
LANGUAGE ARTS
ELEMENTARY
WISE OWL WORKSHOP
WISE OWL WORKSHOP
$10.00
3.2
THIS IS THE TRADITIONAL HANGMAN GAME THAT HAS A CHOICE BETWEEN TRADITIONAL OR RACECAR SCORING.

WORD PROBE
LANGUAGE ARTS
ELEMENTARY JUNIOR
WISE OWL WORKSHOP
WISE OWL WORKSHOP
$10.00
3.2
THIS GAME IS IDEAL FOR PRACTICING SPELLING LISTS.IT ALLOWS STUDENTS TO PLAY AGAINST ONE ANOTHER OR THE COMPUTER.

VOCABULARY I
LANGUAGE ARTS
ELEMENTARY JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 7

VOCABULARY II
LANGUAGE ARTS
ELEMENTARY JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 7

VOCABULARY III
LANGUAGE ARTS
ELEMENTARY JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 7

VOCABULARY IV
LANGUAGE ARTS
ELEMENTARY JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 7

VOCABULARY V
LANGUAGE ARTS
ELEMENTARY JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 7

SPELLING I
LANGUAGE ARTS
ELEMENTARY JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 7

SPELLING II
LANGUAGE ARTS
ELEMENTARY JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 7

ANAGRAMS I
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$15.00
3.2
ALL AGES

ANAGRAMS II
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$15.00
3.2
ALL AGES

ANAGRAMS IX
LANGUAGE ARTS
ELEMENTARY
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$15.00
3.2
NO DESCRIPTION AVAILABLE

ANAGRAMS X
LANGUAGE ARTS
ELEMENTARY
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$15.00
3.2
NO DESCRIPTION AVAILABLE

MYSTERY WORD
LANGUAGE ARTS
ELEMENTARY JUNIOR
RAINBOW COMPUTING INC.
RAINBOW COMPUTING INC.
$19.95
3.2/AS
THIS IS A WORD PROCESSING GAME IN WHICH ONE STUDENT CAN CHALLENGE ANOTHER STUDENT OR THE COMPUTER.VARIABLE SKILL LEVELS.

SIX MICRO STORIES
LANGUAGE ARTS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
ADVENTURE INTERNATIONAL
$14.95
3.2
THE STUDENT BECOMES THE CHARACTER IN A STUDENT (AND COMPUTER) AUTHORED STORY.

NOUNS I AND II
LANGUAGE ARTS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$34.95
3.2
NO DESCRIPTION AVAILABLE

PRONOUNS I AND II
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$34.95
3.2
NO DESCRIPTION AVAILABLE

VERBS I AND II
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$34.95
3.2
NO DESCRIPTION AVAILABLE

ADJECTIVES I AND II
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$43.95
3.2
NO DESCRIPTION AVAILABLE

ADVERBS I AND II
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$34.95
3.2
NO DESCRIPTION AVAILABLE

HOMONYMS I AND II
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$34.95
3.2
NO DESCRIPTION AVAILABLE

SYNONYMS AND ANTONYMS I AND II
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$34.95
3.2
NO DESCRIPTION AVAILABLE

CONTRACTIONS I AND II
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$34.95
3.2
NO DESCRIPTIONS AVAILABLE

SCRAMBLED LETTERS
LANGUAGE ARTS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$14.95
3.2
THIS PROGRAM PRESENTS SCRAMBLED WORDS AND THE STUDENTS COMPETE TO UNSCRAMBLE THE WORDS.(TEACHER CAN VARY THE WORDS)

FLASH SPELLING
LANGUAGE ARTS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$33.50
3.2
A WORD IS FLASHED ON THE SCREEN AND THE STUDENT IS REQUIRED TO TYPE IT IN CORRECTLY.

CRYPTO
LANGUAGE ARTS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$15.95
3.2
STUDENTS DEVELOP SKILLS OF LOGIC BY DECODING NONSENSE SENTENCES.

IMPROVE YOUR VOCABULARY I
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

IMPROVE YOUR VOCABULARY II
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

WORKING WITH ADJECTIVES
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

WORKING WITH ADVERBS
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

WORKING WITH VERBS
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

WORKING WITH SYNONYMS/ANTONYMS
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

WORKING WITH CONTRACTIONS/HOMONYMS
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

WORKING WITH SUBJECTS/NOUNS
LANGUAGE ARTS
ELEMENTARY JUNIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

WORKING WITH PRONOUNS/PROPOSITIONS
LANGUAGE ARTS
ELEMENTARY JUNIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

ENGLISH GRAMMAR-GRADE 3
LANGUAGE ARTS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

ENGLISH GRAMMAR-GRADE 4
LANGUAGE ARTS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

ENGLISH GRAMMAR-GRADE 5
LANGUAGE ARTS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

ENGLISH GRAMMAR-GRADE 6
LANGUAGE ARTS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

ENGLISH GRAMMAR-GRADE 7
LANGUAGE ARTS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

GRADE 1
LANGUAGE ARTS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

GRADE 2
LANGUAGE ARTS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

GRADE 3
LANGUAGE ARTS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

GRADE 4
LANGUAGE ARTS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

GRADE 5
LANGUAGE ARTS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

GRADE 6
LANGUAGE ARTS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

GRADE 7
LANGUAGE ARTS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

GRADE 7
LANGUAGE ARTS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

ENGLISH GRAMMAR
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
MICROPI
MICROPI
$400.00
3.2
THIS IS A SERIES OF DRILL PROGRAMS WHICH TOTAL ABOUT 20-25 HOURS OF INSTRUCTION.

LANGUAGE ARTS SEQUENCES
LANGUAGE ARTS
ELEMENTARY JUNIOR
MILLIKEN
MILLIKEN
$75.00
3.2
THIS PROGRAM CONTAINS STRUCTURED DRILL AND PRACTICE FOR STUDENTS IN LETTER RECOGNITION AND ALPHABETIZATION SKILLS.

SPELLING BUILDER
LANGUAGE ARTS
ELEMENTARY JUNIOR
ACCURATE INFORMATION NOT AVAILABLE
MOYER VICO CORP.
$47.30
3.2
SEVEN LESSONS ON SPELLING RULES PLUS A 320 WORD SPELLING TEST ON AUDIO CASSETTE.

VOCABULARY BUILDER
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
ACCURATE INFORMATION NOT AVAILABLE
MOYER VICO CORP.
$40.70
3.2
CONTAINS TEN LESSONS IN SYNOMYMNS AND ANTONYMNS PLUS A VOCABULARY TEST.

WHAT'S DIFFERENT
LANGUAGE ARTS
ELEMENTARY JUNIOR
ACCURATE INFORMATION NOT AVAILABLE
MOYER VICO CORP.
$40.70
3.2
TEN LESSONS IN WHICH THE STUDENT SELECTS THE WORD THAT DOESN'T BELONG IN A GIVEN LIST.

STORY BUILDER/WORD MASTER
LANGUAGE ARTS
ELEMENTARY JUNIOR
ACCURATE INFORMATION NOT AVAILABLE
MOYER VICO CORP.
$40.70
3.2
STORY BUILDER TEACHES:VERBS NOUNS AND ADJECTIVES.WORD MASTER IS THE CLASSIC HANGMAN GAME.

COMPU-READ
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
ACCURATE INFORMATION NOT AVAILABLE
MOYER VICO CORP.
$47.30
3.2
ELECTRONIC TACHISTOSCOPE TO HELP INCREASE COMPREHENSION AND RETENTION.

CRITICAL READING LESSON SERIES A-H
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
BORG-WARNER EDUCATIONAL SYSTEMS
BORG-WARNER EDUCATIONAL SYSTEMS
$750.00
3.2
INCLUDES 8 DISKS WITH MANAGEMENT SYSTEM AND TEACHER'S GUIDE.

CRITICAL READING LESSON SERIES A-D
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
BORG-WARNER EDUCATIONAL SYSTEMS
BORG-WARNER EDUCATIONAL SYSTEMS
$350.00
3.2
INCLUDES FOUR DISKS WITH MANAGEMENT AND TEACHER'S GUIDE.

CRITICAL READING LESSON SERIES E-H
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
BORG-WARNER EDUCATIONAL SYSTEMS
BORG-WARNER EDUCATIONAL SYSTEMS
$400.00
3.2
INCLUDES 4 DISKS WITH MANAGEMENT SYSTEM AND TEACHER'S GUIDE.

SCRAMBLE
LANGUAGE ARTS
ELEMENTARY JUNIOR
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$19.95
3.2/IB
THIS PROGRAM PRESENTS A SCRAMBLED WORD FOR THE USER TO SORT OUT.

ELEMENTARY-VOLUME 2 (LANGUAGE ARTS)
LANGUAGE ARTS
ELEMENTARY
MECC SOFTWARE
MECC SOFTWARE(IN B.C. FROM JEM RESEARCH)
$15.00
3.2
THIS PROGRAM CONTAINS A WIDE VARIETY OF APPLICATIONS TO THE ELEMENTARY LANGUAGE ARTS PROGRAM.

KEYS
MATHEMATICS LANGUAGE ARTS
ELEMENTARY
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$19.95
3.2/IB
THIS PROGRAM IS DESIGNED TO INCREASE LETTER AND NUMBER RECOGNITION IN YOUNG CHILDREN.

DRILL II
MATHEMATICS LANGUAGE ARTS
ELEMENTARY JUNIOR
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$29.95

THIS PROGRAM PROVIDES PRACTICE DRILL IN ADDITION,SUBTRACTION, MULTIPLICATION,AND DIVISION AS WELL AS SPELLING.

SCHOOL DAYS
MATHEMATICS LANGUAGE ARTS
ELEMENTARY JUNIOR
MONUMENT COMPUTER SERVICE
MONUMENT COMPUTER SERVICE
$49.95
3.2/AS & IB
THIS PROGRAM ALLOWS THE APPLE TO TEACH SPELLING AND MATH IN A UNIQUE AND CREATIVE MANNER.

ELEMENTARY-VOLUME 5 (LANGUAGE ARTS)
LANGUAGE ARTS
ELEMENTARY
MECC SOFTWARE
MECC SOFTWARE(IN B.C. FROM JEM RESEARCH)
$15.00
3.2
THIS PROGRAM DEALS WITH THE READING CONCEPTS OF PREFIXES.

MEMORY BUILDER
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$23.95
3.2/IB
THIS IS PRIMARILY A MEMORY IMPROVING PROGRAM IN WHICH STUDENTS CAN PLAY THE COMPUTER OR EACH OTHER.

STORY BUILDER/WORD MASTER
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$23.95
3.2/IB
THIS PROGRAM PROVIDES A SERIES OF PARTIALLY COMPLETED SENTENCES WHICH THE STUDENT MUST CORRECTLY COMPLETE.

MINICROSSWORD
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$23.95
3.2
THIS IS A CROSSWORD TYPE OF GAME IN WHICH THE STUDENT MUST HAVE SUFFICIENT VOCABULARY MASTERY TO COMPETE.

CODE BREAKER
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$23.95
3.2/AS
THIS PROGRAM PRESENTS SCRAMBLED WORDS WHICH THE STUDENT MUST PUT TOGETHER TO SOLVE THE LARGER PUZZLE.

PRESCHOOL IQ BUILDER
LANGUAGE ARTS
ELEMENTARY
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$23.95
3.2/IB
THIS PROGRAM TEACHES COGNITIVE SKILLS THAT ARE VITAL TO PRESCHOOLERS.

READING COMPREHENSION:WHAT'S DIFFERENT?
LANGUAGE ARTS
ELEMENTARY JUNIOR
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$23.95
3.2/AS
THE COMPUTER PRESENTS LIST OF WORDS AND ASKS THE STUDENT TO PICK THE ONE WORD WHICH DOESN'T BELONG.

SPELL-N-TIME
LANGUAGE ARTS
ELEMENTARY JUNIOR
COURSEWARE MAGAZINE
COURSEWARE MAGAZINE
N/A
3.2
THE COMPUTER FLASHES A WHOLE WORD AND THE STUDENT MUST SPELL THE WORD CORRECTLY.

REVERSE
LANGUAGE ARTS
ELEMENTARY JUNIOR
COURSEWARE MAGAZINE
COURSEWARE MAGAZINE

3.2
THE COMPUTER PRESENTS A NUMBER OF WORDS IN WHICH THE LETTERS ARE SCRAMBLED SO THAT THE STUDENT MUST UNSCRAMBLE THEM.

COMPU-READ
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$37.95
3.2/AS
THIS PROGRAM IS DESIGNED TO RAPIDLY INCREASE READING COMPREHENSION AND RETENTION.

STORYTELLER
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$29.95
3.2/AS
THIS IS AN ENGLISH GRAMMAR AID WHICH REINFORCES PROPER ENGLISH USAGE.

COMPU-SPELL
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$59.95
3.2/AS
THIS PROGRAM EMPLOYS POSITIVE FEEDBACK TO ENSURE ACCURATE LEARNING.

SPELLING RULES
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$37.50
3.2/AS
THIS PROGRAM DEMONSTRATES MANY OF THE RULES ENCOUNTERED IN THE SPELLING OF COMMON LANGUAGE RULES.

SENTENCES
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$31.50
3.2/AS
THIS PROGRAM CONTAINS MANY OF THE RULES ENCOUNTERED IN SENTENCE DEVELOPMENT.THE STUDENT ALSO GETS PRACTICE IN IDENTIFICATION OF SENTENCE PARTS.

SCHOOL HOUSE FIVE
LANGUAGE ARTS MATHEMATICS
ELEMENTARY
APPLE-CATIONS
APPLE CATIONS
$14.95
3.2/
THIS IS A SERIES OF FIVE PROGRAMS WHICH INCLUDE:SPELLING WORDS ,HANGMAN,WORD FUN,ADDING COLUMNS,FRACTION PROBLEMS,AND DIVISION WITH REMAINDER.

CRAZY SENTENCES
LANGUAGE ARTS
ELEMENTARY JUNIOR
EDUTEK
EDUTEK
$19.50
3.2/
THIS PROGRAM ALLOWS THE STUDENT TO PLAY WITH SENTENCE PARTS TO CREATE CRAZY SENTENCES.

WHAT WAS THAT WORD?
LANGUAGE ARTS
ELEMENTARY JUNIOR
EDUTEK
EDUTEK
$19.50
3.2/
THE COMPUTER FLASHES A WORD ON THE SCREEN THAT THE STUDENT MUST PICK UP.

SHORT VOWEL EXERCISE
LANGUAGE ARTS
ELEMENTARY JUNIOR
EDUTEK
EDUTEK
$19.50
3.2/
THIS PROGRAM PROVIDES PRACTICE IN SAYING THE SHORT VOWEL SOUNDS.

READER
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
OMNICO
OMNICO
$150.00
3.2/
THIS PROGRAM ALLOWS THE TEACHER TO TEST THE STUDENT'S READING AND COMPREHENSION SCORES.

STORIES
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR COLLEGE
OMNICO
OMNICO
$55.00
3.2/
EACH DISKETTE CONTAINS FROM 10 TO 20 STORIES DEPENDING ON THE GRADE LEVEL.

MY ABC'S
LANGUAGE ARTS
ELEMENTARY
SOFTAGON
SOFTAGON
$19.95
3.2/
THIS PROGRAM HELPS THE STUDENT TO DISTINGUISH BETWEEN THE CAPITAL AND SMALL LETTERS.

NOW I CAN RHYME
LANGUAGE ARTS
ELEMENTARY
SOFTAGON
SOFTAGON
$19.95
3.2/
THE STUDENT SELECTS PICTURES IN WHICH THE WORDS DESCRIBING THE PICTURES RHYME.

CROSS WORDS
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
CREATIVE SOFTWARE
CREATIVE SOFTWARE
$19.95
3.2/AS
THIS IS THE CLASSIC GAME THAT ACTS AS A GREAT VOCABULARY BUILDER.

DR. DALEY'S BEST SOFTWARE
SCIENCE MATHEMATICS LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR COLLEGE
DR. DALEY
DR. DALEY
$79.95
3.2/AS
THIS IS AN EXCELLENT VALUE CONTAINING OVER 50 PROGRAMS AT A COMBINED LIST OF OVER $400.00. THERE IS A LARGE VARIETY OF PROGRAMS WITH 50 PAGES OF DOCUMENTATION.

LANGUAGE DRILL
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
SOFT-ONE
SOFT-ONE
$7.50
3.2/AS
THIS IS A PROGRAM THAT CAN BE USED FOR DRILLING THE STUDENT IN ANY LANGUAGE THAT THE STUDENT ENTERS.

APPLE-GRAMMAR
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
EDUCATIONAL SOFTWARE PROFESSIONALS
EDUCATIONAL SOFTWARE PROFESSIONALS
$19.95
3.2/AS
THIS PROGRAM TEACHES THE BASIC SKILLS OF GRAMMAR.

SKILLDRILL #2 - STIMULUS WORD, RESPONSE DISPLAYED
LANGUAGE ARTS
ELEMENTARY JUNIOR
HARTLEY SOFTWARE
HARTLEY SOFTWARE
$92.95
3.2
THIS PROGRAM WILL DRILL THE STUDENT AS WELL AS GIVE LESSONS IN THE USE OF AFFIXES,HOMONYMS,PLURALS,CONTRACTIONS,COMPOUNDS, AND CONFUSED WORDS.

SKILLDRILL #1 - STIMULUS WORD WITH BLANKS
LANGUAGE ARTS
ELEMENTARY JUNIOR
HARTLEY SOFTWARE
HARTLEY SOFTWARE
$136.45
3.2
THIS PROGRAM WILL DRILL THE STUDENT IN SIMPLE SPELLING PLUS PROVIDE A NUMBER OF CONSONANT AND VOWEL LESSONS.

SPELLING TEST #3
LANGUAGE ARTS
ELEMENTARY JUNIOR
HARTLEY SOFTWARE
HARTLEY SOFTWARE
$14.95
3.2
THIS USES THE "SPELLER BOX" TO PRESENT SPELLING TESTS TO STUDENTS. THIS IS USEFUL AS A TEST GIVER.

U-SPELL
LANGUAGE ARTS
ELEMENTARY JUNIOR
MENTOR SOFTWARE INC.
MENTOR SOFTWARE INC.
$34.95
3.2
THE STUDENT HEARS THE WORD AND SEES THE CONTEXT SENTENCE ON THE SCREEN AND THEN ANSWERS WITH THE CORRECT RESPONSE.

READING COMPREHENSION:WHAT'S DIFFERENT?
LANGUAGE ARTS
ELEMENTARY JUNIOR
PROGRAM DESIGN INC.
QUEUE
$19.95/14.95
3.2/IB
THIS PROGRAM PRESENTS LOGICAL PROBLEMS WHERE ONE WORD IN FOUR DOESN'T BELONG WITH THE REST.

STORY BUILDER/WORD MASTER
LANGUAGE ARTS
ELEMENTARY JUNIOR
PROGRAM DESIGN INC.
QUEUE
$19.95/14.95
3.2/IB
THIS IS A LOGIC GAME WHERE THE COMPUTER PRESENTS A SERIES OF PARTIALLY COMPLETED SENTENCES THAT THE STUDENT MUST COMPLETE.

GAME POWER FOR PHONICS
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
WISE OWL WORKSHOP
WISE OWL WORKSHOP
$24.50
3.2
THIS PROGRAM STRESSES INTENSIVE VERBAL REHEARSAL,REINFORCES BASIC SKILLS,INDEPENDANT OR GROUP WORK,AND IS ADAPTABLE TO ALL GRADE LEVELS.

JABBERWOCKY
LANGUAGE ARTS
ELEMENTARY JUNIOR
WISE OWL WORKSHOP
WISE OWL WORKSHOP
$12.00
3.2
THIS IS AN ENGLISH STUDY GAME THAT DRILLS THE STUDENTS ON THE PARTS OF SPEECH.CAN BE PLAYED INDEPENDENTLY OR IN GROUPS.

WORD PROBE
LANGUAGE ARTS
ELEMENTARY JUNIOR
WISE OWL WORKSHOP
WISE OWL WORKSHOP
$10.00
3.2
THIS GAME IS IDEAL FOR PRACTICING SPELLING LISTS.IT ALLOWS STUDENTS TO PLAY AGAINST ONE ANOTHER OR THE COMPUTER.

VOCABULARY I
LANGUAGE ARTS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 12

VOCABULARY II
LANGUAGE ARTS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 12

VOCABULARY III
LANGUAGE ARTS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 12

VOCABULARY IV
LANGUAGE ARTS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 12

VOCABULARY V
LANGUAGE ARTS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 12

VOCABULARY I
LANGUAGE ARTS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 11

VOCABULARY II
LANGUAGE ARTS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 11

VOCABULARY III
LANGUAGE ARTS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 11

VOCABULARY IV
LANGUAGE ARTS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 11

VOCABULARY V
LANGUAGE ARTS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 11

VOCABULARY I
LANGUAGE ARTS
JUNIOR/SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 10

VOCABULARY II
LANGUAGE ARTS
JUNIOR/SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 10

VOCABULARY III
LANGUAGE ARTS
JUNIOR/SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 10

VOCABULARY IV
LANGUAGE ARTS
JUNIOR/SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 10

VOCABULARY V
LANGUAGE ARTS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 10

VOCABULARY I
LANGUAGE ARTS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 9

VOCABULARY II
LANGUAGE ARTS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 9

VOCABULARY III
LANGUAGE ARTS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 9

VOCABULARY IV
LANGUAGE ARTS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 9

VOCABULARY V
LANGUAGE ARTS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 9

VOCABULARY I
LANGUAGE ARTS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 8

VOCABULARY II
LANGUAGE ARTS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 8

VOCABULARY III
LANGUAGE ARTS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 8

VOCABULARY IV
LANGUAGE ARTS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 8

VOCABULARY V
LANGUAGE ARTS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 8

VOCABULARY I
LANGUAGE ARTS
ELEMENTARY JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 7

VOCABULARY II
LANGUAGE ARTS
ELEMENTARY JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 7

VOCABULARY III
LANGUAGE ARTS
ELEMENTARY JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 7

VOCABULARY IV
LANGUAGE ARTS
ELEMENTARY JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 7

VOCABULARY V
LANGUAGE ARTS
ELEMENTARY JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 7

SPELLING I
LANGUAGE ARTS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 12

SPELLING II
LANGUAGE ARTS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 12

SPELLING I
LANGUAGE ARTS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 11

SPELLING II
LANGUAGE ARTS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 11

SPELLING I
LANGUAGE ARTS
JUNIOR/SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 10

SPELLING II
LANGUAGE ARTS
JUNIOR/SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 10

SPELLING I
LANGUAGE ARTS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 9

SPELLING II
LANGUAGE ARTS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 9

SPELLING I
LANGUAGE ARTS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 8

SPELLING II
LANGUAGE ARTS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 8

SPELLING I
LANGUAGE ARTS
ELEMENTARY JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 7

SPELLING II
LANGUAGE ARTS
ELEMENTARY JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GRADE 7

ANAGRAMS I
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$15.00
3.2
ALL AGES

ANAGRAMS II
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$15.00
3.2
ALL AGES

ANAGRAMS III
LANGUAGE ARTS
(COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$15.00
3.2

ANAGRAMS IV
LANGUAGE ARTS
(COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$15.00
3.2
NO DESCRIPTION AVAILABLE

ANAGRAMS V
LANGUAGE ARTS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$15.00
3.2
NO DESCRIPTION AVAILABLE

ANAGRAMS VI
LANGUAGE ARTS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$15.00
3.2
NO DESCRIPTION AVAILABLE

ANAGRAMS VII
LANGUAGE ARTS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$15.00
3.2
NO DESCRIPTION AVAILABLE

ANAGRAMS VIII
LANGUAGE ARTS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$15.00
3.2
NO DESCRIPTION AVAILABLE

MYSTERY WORD
LANGUAGE ARTS
ELEMENTARY JUNIOR
RAINBOW COMPUTING INC.
RAINBOW COMPUTING INC.
$19.95
3.2/AS
THIS IS A WORD PROCESSING GAME IN WHICH ONE STUDENT CAN CHALLENGE ANOTHER STUDENT OR THE COMPUTER.VARIABLE SKILL LEVELS.

SIX MICRO STORIES
LANGUAGE ARTS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
ADVENTURE INTERNATIONAL
$14.95
3.2
THE STUDENT BECOMES THE CHARACTER IN A STUDENT (AND COMPUTER) AUTHORED STORY.

NOUNS I AND II
LANGUAGE ARTS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$34.95
3.2
NO DESCRIPTION AVAILABLE

PRONOUNS I AND II
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$34.95
3.2
NO DESCRIPTION AVAILABLE

VERBS I AND II
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$34.95
3.2
NO DESCRIPTION AVAILABLE

ADJECTIVES I AND II
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$43.95
3.2
NO DESCRIPTION AVAILABLE

ADVERBS I AND II
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$34.95
3.2
NO DESCRIPTION AVAILABLE

SYNONYMS AND ANTONYMS I AND II
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$34.95
3.2
NO DESCRIPTION AVAILABLE

HOMONYMS I AND II
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$34.95
3.2
NO DESCRIPTION AVAILABLE

CONTRACTIONS I AND II
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$34.95
3.2
NO DESCRIPTIONS AVAILABLE

SCRAMBLED LETTERS
LANGUAGE ARTS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$14.95
3.2
THIS PROGRAM PRESENTS SCRAMBLED WORDS AND THE STUDENTS COMPETE TO UNSCRAMBLE THE WORDS.(TEACHER CAN VARY THE WORDS)

FLASH SPELLING
LANGUAGE ARTS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$33.50
3.2
A WORD IS FLASHED ON THE SCREEN AND THE STUDENT IS REQUIRED TO TYPE IT IN CORRECTLY.

CRYPTO
LANGUAGE ARTS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$15.95
3.2
STUDENTS DEVELOP SKILLS OF LOGIC BY DECODING NONSENSE SENTENCES.

IMPROVE YOUR VOCABULARY I
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

IMPROVE YOUR VOCABULARY II
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

WORKING WITH ADJECTIVES
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

WORKING WITH ADVERBS
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

WORKING WITH VERBS
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

WORKING WITH SYNONYMS/ANTONYMS
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

WORKING WITH CONTRACTIONS/HOMONYMS
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
PART OF THE TYC SUBJECT DATA TAPES SERIES.

WORKING WITH SUBJECTS/NOUNS
LANGUAGE ARTS
ELEMENTARY JUNIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

80

WORKING WITH PRONOUNS/PROPOSITIONS
LANGUAGE ARTS
ELEMENTARY JUNIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

ENGLISH GRAMMAR-GRADE 8
LANGUAGE ARTS
JUNIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

ENGLISH GRAMMAR-GRADE 9
LANGUAGE ARTS
JUNIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

ENGLISH GRAMMAR-GRADE 10
LANGUAGE ARTS
JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

ENGLISH GRAMMAR-GRADE 11
LANGUAGE ARTS
SENIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

ENGLISH GRAMMAR/GRADE 12
LANGUAGE ARTS
SENIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

GRADE 8
LANGUAGE ARTS
JUNIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

GRADE 9
LANGUAGE ARTS
JUNIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

GRADE 10
LANGUAGE ARTS
JUNIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

GRADE 11
LANGUAGE ARTS
SENIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

ENGLISH GRAMMAR
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
MICROPI
MICROPI
$400.00
3.2
THIS IS A SERIES OF DRILL PROGRAMS WHICH TOTAL ABOUT 20-25 HOURS OF INSTRUCTION.

LANGUAGE ARTS SEQUENCES
LANGUAGE ARTS
ELEMENTARY JUNIOR
MILLIKEN
MILLIKEN
$75.00
3.2
THIS PROGRAM CONTAINS STRUCTURED DRILL AND PRACTICE FOR STUDENTS IN LETTER RECOGNITION AND ALPHABETIZATION SKILLS.

SPELLING BUILDER
LANGUAGE ARTS
ELEMENTARY JUNIOR
ACCURATE INFORMATION NOT AVAILABLE
MOYER VICO CORP.
$47.30
3.2
SEVEN LESSONS ON SPELLING RULES PLUS A 320 WORD SPELLING TEST ON AUDIO CASSETTE.

VOCABULARY BUILDER
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
ACCURATE INFORMATION NOT AVAILABLE
MOYER VICO CORP.
$40.70
3.2
CONTAINS TEN LESSONS IN SYNOMYMNS AND ANTONYMNS PLUS A VOCABULARY TEST.

WHAT'S DIFFERENT
LANGUAGE ARTS
ELEMENTARY JUNIOR
ACCURATE INFORMATION NOT AVAILABLE
MOYER VICO CORP.
$40.70
3.2
TEN LESSONS IN WHICH THE STUDENT SELECTS THE WORD THAT DOESN'T BELONG IN A GIVEN LIST.

STORY BUILDER/WORD MASTER
LANGUAGE ARTS
ELEMENTARY JUNIOR
ACCURATE INFORMATION NOT AVAILABLE
MOYER VICO CORP.
$40.70
3.2
STORY BUILDER TEACHES:VERBS NOUNS AND ADJECTIVES.WORD MASTER IS THE CLASSIC HANGMAN GAME.

COMPU-READ
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
ACCURATE INFORMATION NOT AVAILABLE
MOYER VICO CORP.
$47.30
3.2
ELECTRONIC TACHISTOSCOPE TO HELP INCREASE COMPREHENSION AND RETENTION.

CRITICAL READING LESSON SERIES A-H
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
BORG-WARNER EDUCATIONAL SYSTEMS
BORG-WARNER EDUCATIONAL SYSTEMS
$750.00
3.2
INCLUDES 8 DISKS WITH MANAGEMENT SYSTEM AND TEACHER'S GUIDE.

CRITICAL READING LESSON SERIES A-D
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
BORG-WARNER EDUCATIONAL SYSTEMS
BORG-WARNER EDUCATIONAL SYSTEMS
$350.00
3.2
INCLUDES FOUR DISKS WITH MANAGEMENT AND TEACHER'S GUIDE.

CRITICAL READING LESSON SERIES E-H
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
BORG-WARNER EDUCATIONAL SYSTEMS
BORG-WARNER EDUCATIONAL SYSTEMS
$400.00
3.2
INCLUDES 4 DISKS WITH MANAGEMENT SYSTEM AND TEACHER'S GUIDE.

SCRAMBLE
LANGUAGE ARTS
ELEMENTARY JUNIOR
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$19.95
3.2/IB
THIS PROGRAM PRESENTS A SCRAMBLED WORD FOR THE USER TO SORT OUT.

DRILL II
MATHEMATICS LANGUAGE ARTS
ELEMENTARY JUNIOR
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$29.95

THIS PROGRAM PROVIDES PRACTICE DRILL IN ADDITION,SUBTRACTION, MULTIPLICATION,AND DIVISION AS WELL AS SPELLING.

SCHOOL DAYS
MATHEMATICS LANGUAGE ARTS
ELEMENTARY JUNIOR
MONUMENT COMPUTER SERVICE
MONUMENT COMPUTER SERVICE
$49.95
3.2/AS & IB
THIS PROGRAM ALLOWS THE APPLE TO TEACH SPELLING AND MATH IN A UNIQUE AND CREATIVE MANNER.

MEMORY BUILDER
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$23.95
3.2/IB
THIS IS PRIMARILY A MEMORY IMPROVING PROGRAM IN WHICH STUDENTS CAN PLAY THE COMPUTER OR EACH OTHER.

STORY BUILDER/WORD MASTER
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$23.95
3.2/IB
THIS PROGRAM PROVIDES A SERIES OF PARTIALLY COMPLETED SENTENCES WHICH THE STUDENT MUST CORRECTLY COMPLETE.

MINICROSSWORD
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$23.95
3.2
THIS IS A CROSSWORD TYPE OF GAME IN WHICH THE STUDENT MUST HAVE SUFFICIENT VOCABULARY MASTERY TO COMPETE.

CODE BREAKER
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$23.95
3.2/AS
THIS PROGRAM PRESENTS SCRAMBLED WORDS WHICH THE STUDENT MUST PUT TOGETHER TO SOLVE THE LARGER PUZZLE.

ASTRO QUOTES
LANGUAGE ARTS
SENIOR COLLEGE
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$23.95
3.2/AS
THE COMPUTER GENERATES A SERIES OF MIXED UP QUOTATIONS WHICH THE STUDENT MUST CORRECTLY ARRANGE AND PRESENT TO THE COMPUTER

VOCABULARY BUILDER 1:BEGINNING
LANGUAGE ARTS
JUNIOR/SENIOR COLLEGE
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$23.95
3.2
THIS IS AN EXTENSIVE VOCABULARY BUILDER WHICH MAKES SPECIAL USE OF SYNONYMS AND ANTONYMS.

VOCABULARY BUILDER 2:ADVANCED
LANGUAGE ARTS
JUNIOR/SENIOR COLLEGE
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$23.95
3.2/IB
THIS IS SIMILAR TO THE VOCABULARY 1 ONLY WITH A MORE ADVANCED VOCABULARY LIST.

ANALOGIES
LANGUAGE ARTS
JUNIOR/SENIOR COLLEGE
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$23.95
3.2/IB
THIS PROGRAM TEACHES WHAT AN ANALOGY IS AND WHAT THE COMMON TYPES ARE.

READING COMPREHENSION:WHAT'S DIFFERENT?
LANGUAGE ARTS
ELEMENTARY JUNIOR
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$23.95
3.2/AS
THE COMPUTER PRESENTS LIST OF WORDS AND ASKS THE STUDENT TO PICK THE ONE WORD WHICH DOESN'T BELONG.

SPELLING BUILDER
LANGUAGE ARTS
JUNIOR/SENIOR COLLEGE
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$26.50
3.2/AS
THIS PROGRAM TEACHES IMPORTANT SPELLING AND GRAMMAR RULES TO THE ADVANCED GRADES.

SPELL-N-TIME
LANGUAGE ARTS
ELEMENTARY JUNIOR
COURSEWARE MAGAZINE
COURSEWARE MAGAZINE
N/A
3.2
THE COMPUTER FLASHES A WHOLE WORD AND THE STUDENT MUST SPELL THE WORD CORRECTLY.

REVERSE
LANGUAGE ARTS
ELEMENTARY JUNIOR
COURSEWARE MAGAZINE
COURSEWARE MAGAZINE

3.2
THE COMPUTER PRESENTS A NUMBER OF WORDS IN WHICH THE LETTERS ARE SCRAMBLED SO THAT THE STUDENT MUST UNSCRAMBLE THEM.

PRACTICANDO ESPANOL CON LA MANZANA II
FOREIGN LANGUAGES LANGUAGE ARTS
JUNIOR/SENIOR COLLEGE
CONDUIT
CONDUIT
$100.00
3.2/IB
THIS IS A COMPUTER ASSISTED LANGUAGE ARTS LESSON IN SPANISH.

COMPU-READ
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$37.95
3.2/AS
THIS PROGRAM IS DESIGNED TO RAPIDLY INCREASE READING COMPREHENSION AND RETENTION.

STORYTELLER
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$29.95
3.2/AS
THIS IS AN ENGLISH GRAMMAR AID WHICH REINFORCES PROPER ENGLISH USAGE.

COMPU-SPELL
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$59.95
3.2/AS
THIS PROGRAM EMPLOYS POSITIVE FEEDBACK TO ENSURE ACCURATE LEARNING.

SPELLING RULES
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$37.50
3.2/AS
THIS PROGRAM DEMONSTRATES MANY OF THE RULES ENCOUNTERED IN THE SPELLING OF COMMON LANGUAGE RULES.

SENTENCES
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$31.50
3.2/AS
THIS PROGRAM CONTAINS MANY OF THE RULES ENCOUNTERED IN SENTENCE DEVELOPMENT.THE STUDENT ALSO GETS PRACTICE IN IDENTIFICATION OF SENTENCE PARTS.

CRAZY SENTENCES
LANGUAGE ARTS
ELEMENTARY JUNIOR
EDUTEK
EDUTEK
$19.50
3.2/
THIS PROGRAM ALLOWS THE STUDENT TO PLAY WITH SENTENCE PARTS TO CREATE CRAZY SENTENCES.

WHAT WAS THAT WORD?
LANGUAGE ARTS
ELEMENTARY JUNIOR
EDUTEK
EDUTEK
$19.50
3.2/
THE COMPUTER FLASHES A WORD ON THE SCREEN THAT THE STUDENT MUST PICK UP.

SHORT VOWEL EXERCISE
LANGUAGE ARTS
ELEMENTARY JUNIOR
EDUTEK
EDUTEK
$19.50
3.2/
THIS PROGRAM PROVIDES PRACTICE IN SAYING THE SHORT VOWEL SOUNDS.

BRAIN TEASER
LANGUAGE ARTS
JUNIOR/SENIOR
EDUTEK
EDUTEK
$19.50
3.2/
THIS IS A NON-NUMERIC LOGIC GAME.

READER
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
OMNICO
OMNICO
$150.00
3.2/
THIS PROGRAM ALLOWS THE TEACHER TO TEST THE STUDENT'S READING AND COMPREHENSION SCORES.

STORIES
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR COLLEGE
OMNICO
OMNICO
$55.00
3.2/
EACH DISKETTE CONTAINS FROM 10 TO 20 STORIES DEPENDING ON THE GRADE LEVEL.

VOCABULARY BUILDER
LANGUAGE ARTS
JUNIOR SENIOR COLLEGE
SLIWA ENTERPRISES
SLIWA ENTERPRISES
$19.95
3.2/
THIS PROGRAM CONTAINS OVER 1600 ENTRIES WITH THE OPTION OF MATCHING SYNONYMNS OR ANTONYMNS.

ANALOGY
LANGUAGE ARTS
JUNIOR/SENIOR COLLEGE
SLIWA ENTERPRISES
SLIWA ENTERPRISES
$19.95
3.2
THIS PROGRAM CONTAINS OVER 1200 WORD RELATIONSHIPS.

SENTENCE COMPLETION
LANGUAGE ARTS
JUNIOR/SENIOR
SLIWA ENTERPRISES
SLIWA ENTERPRISES
$19.95
3.2/
THIS PROGRAM IS THE EQUIVALENT OF SIX SAT TESTS.

VERBAL SKILLS PAK
LANGUAGE ARTS
JUNIOR/SENIOR
SLIWA ENTERPRISES
SLIWA ENTERPRISES
$44.95
3.2
THIS PACKAGE CONTAINS THE THREE PROGRAMS:VOCABULARY BUILDER, ANALOGY,AND SENTENCE COMPLETION.

APPLE BARREL BUSHEL # 1
PROGRAMMING AIDS LANGUAAGE ARTS MATHEMATICS
ELEMENTARY JUNIOR/SENIOR
APPLE BARREL
APPLE BARREL
$29.95
3.2/AS
THIS IS A COLLECTION OF A VARIETY OF EDUCATIONAL TOOLS AND GAMES.

THE COUNT
LANGUAGE ARTS
JUNIOR/SENIOR
ADVENTURE INTERNATIONAL
ADVENTURE INTERNATIONAL
$14.95
3.2/AS
THE COMPUTER PROVIDES A SITUATION THAT THE STUDENT MUST CREATE A STORY AROUND.THIS IS A GOOD CREATIVE WRITING AID.

CROSS WORDS
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
CREATIVE SOFTWARE
CREATIVE SOFTWARE
$19.95
3.2/AS
THIS IS THE CLASSIC GAME THAT ACTS AS A GREAT VOCABULARY BUILDER.

DR. DALEY'S BEST SOFTWARE
SCIENCE MATHEMATICS LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR COLLEGE
DR. DALEY
DR. DALEY
$79.95
3.2/AS
THIS IS AN EXCELLENT VALUE CONTAINING OVER 50 PROGRAMS AT A COMBINED LIST OF OVER $400.00. THERE IS A LARGE VARIETY OF PROGRAMS WITH 50 PAGES OF DOCUMENTATION.

LANGUAGE DRILL
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
SOFT-ONE
SOFT-ONE
$7.50
3.2/AS
THIS IS A PROGRAM THAT CAN BE USED FOR DRILLING THE STUDENT IN ANY LANGUAGE THAT THE STUDENT ENTERS.

APPLE-GRAMMAR
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
EDUCATIONAL SOFTWARE PROFESSIONALS
EDUCATIONAL SOFTWARE PROFESSIONALS
$19.95
3.2/AS
THIS PROGRAM TEACHES THE BASIC SKILLS OF GRAMMAR.

"CLOCK" TIME TEACHING PROGRAM
MATHEMATICS
ELEMENTARY
HARTLEY SOFTWARE
HARTLEY SOFTWARE
$29.95
3.2
THE COMPUTER SIMULATES A CLOCK AND ASKS THE STUDENT TO MANIPULATE THE TIME IN CERTAIN WAYS AS WELL AS ANSWER QUESTIONS.

PRESCRIPTIIVE MATH DRILL
MATHEMATICS
ELEMENTARY
HARTLEY SOFTWARE
HARTLEY SOFTWARE
$79.95
3.2
THIS PROGRAM OFFERS EXERCISE IN ADDITION,SUBTRACTION,MULTIPLICATION,AND DIVISION. THE TEACHER CAN CONTROL THE DIFFICULTY.

MATHGRID
MATHEMATICS
ELEMENTARY
IDEATECH
IDEATECH
$11.95/10.95
3.2
AUDITORY FEEDBACK IS USED TO PROMOTE ACCURATE LEARNING OF THE MULTIPLICATION TABLES.

MULTIPLICATION AND DIVISION FUN
MATHEMATICS
ELEMENTARY
IDEATECH
IDEATECH
$7.95/6.95
3.2
THE COMPUTER PROVIDES A MULTIPLICATION AND DIVISION TEST FOR THE STUDENT WITH FEEDBACK OF THE RESULTS.

SPEED FACTS
MATHEMATICS
ELEMENTARY
IDEATECH
IDEATECH
$11.95/10.95
3.2
THIS IS DESIGNED SO THAT STUDENTS CAN INCREASE THE ACCURACY AND THE RATE OF RESPONSE FOR THE BASIC MATH SKILLS.

THE SHELL GAMES
MATHEMATICS
ELEMENTARY/JUNIOR/SENIOR
APPLE COMPUTER INC.
LOCAL DEALER

A SELECTION OF FOUR EDUCATIONAL QUIZZ GAMES.

MATH SKILL GAMES-REGROUPING
MATHEMATICS
ELEMENTARY JUNIOR
MENTOR SOFTWARE INC.
MENTOR SOFTWARE INC.
$79.95
3.2
USES GRAPHICS TO PROVIDE STUDENTS PRACTICE IN REGROUPING CONCEPTS.

BASIC MATH SKILL GAMES
MATHEMATICS
ELEMENTARY JUNIOR
MENTOR SOFTWARE INC.
MENTOR SOFTWARE INC.
$94.95
3.2
THIS PROGRAM PRESENTS THE VARIOUS MATH BASICS AT THREE DIFFERENT DIFFICULTY LEVELS.

MATH WORD PROBLEMS
MATH
ELEMENTARY
MENTOR SOFTWARE INC.
MENTOR SOFTWARE INC.
$54.95
3.2
THIS GIVES THE STUDENTS PRACTICE IN TRANSLATING VERBAL PROBLEMS INTO MATHEMATICAL SENTENCES.

MUMATH
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR (COLLEGE)
MICROSOFT
MICROSOFT

3.2
THIS IS A COMPUTER SUPPLEMENT THAT ALLOWS THE COMPUTER TO DO ALGEBRA,TRIGONOMETRY,CALCULUS,INTEGRATION,AND DIFFERENTIATION.

FLASH CARDS
MATHEMATICS
ELEMENTARY JUNIOR
WISE OWL WORKSHOP
WISE OWL WORKSHOP
$10.00
3.2
THIS IS A MATH PRACTICE GAME THAT GIVES POINTS FOR QUICK RESPONSES.

INTRODUCTION TO MATHEMATICS ON THE COMPUTER
MATHEMATICS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$34.95
3.2
DESIGNED TO TEACH SLOW LEARNERS THE BASICS OF ADDITION, SUBTRACTION,MULTIPLICATION AND DIVISION WITH SIX DIFFICULTY LEVELS.AVAILABLE ON DISKETTE WITH INTRO TO DECIMALS FOR $64.90

INTRODUCTION TO DECIMALS ON THE COMPUTER
MATHEMATICS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$64.90
3.2
THIS PROGRAM COVERS THE BASICS OF DECIMALS WITH SIX LEVELS OF DIFFICULTY.AVAILABLE WITH "INTRO TO MATH" ON DISK FOR $64.90

MISSING MATH FACTS
MATHEMATICS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$34.95
3.2
THE COMPUTER DISPLAYS A PROBLEM AND OMITS ONE PART OF THE EQUATION WHICH THE STUDENT MUST ENTER.

ADD,SUBTRACT,MULTIPLY AND DIVIDE WHOLE NUMBERS
MATHEMATICS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$36.90
3.2
NO DESCRIPTION AVAILABLE

TABLES 1-12 AND ROUNDING OFF NUMBERS
MATHEMATICS
ELEMENTARY
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$36.90
3.2
NO DESCRIPTION AVAILABLE

FRACTIONS-ADD,SUBTRACT,MULTIPLY AND DIVIDE
MATHEMATICS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$36.90
3.2
NO DESCRIPTION AVAILABLE

SPEED DRILL
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR
STEKETEE EDUCATIONAL SOFTWARE
STEKETEE EDUCATIONAL SOFTWARE
$17.95
3.2
THIS PROGRAM DRILLS THE STUDENT IN THE BASIC NUMBER FACTS.

REVERSE
MATHEMATICS
ELEMENTARY JUNIOR
STEKETEE EDUCATIONAL SOFTWARE
STEKETEE EDUCATIONAL SOFTWARE
$17.95
3.2
THE COMPUTER PRESENTS A SERIES OF ORDERED NUMBERS AND THEN SCRAMBLES THEM AND ASKS THE STUDENT TO REARRANGE THEM.

FRACTION RECOGNITION
MATHEMATICS
ELEMENTARY JUNIOR
STEKETEE EDUCATIONAL SOFTWARE
STEKETEE EDUCATIONAL SOFTWARE
$17.95
3.2
THIS PROGRAM MAKES EXTENSIVE USE OF HIGH RESOLUTION GRAPHICS TO TEACH A STUDENT TO RECOGNISE FRACTIONS.

GUESS THE NUMBER
MATHEMATICS
ELEMENTARY JUNIOR
STEKETEE EDUCATIONAL SOFTWARE
STEKETEE EDUCATIONAL SOFTWARE
$17.95
3.2
THE COMPUTER GUESSES A NUMBER AND THE STUDENT THEN ATTEMPTS TO GUESS THE NUMBER ACCORDING TO CERTAIN CLUES GIVEN BY THE COMPUTER.

NUMBER LINE
MATHEMATICS
ELEMENTARY JUNIOR
STEKETEE EDUCATIONAL SOFTWARE
STEKETEE EDUCATIONAL SOFTWARE
$17.95
3.2
THIS PROGRAM TEACHES THE STUDENT TO WORK WITH THE BASIC METHODS OF USING POSITIVE AND NEGATIVE NUMBERS.

ELEMENTARY MATH PACKAGE I
MATHEMATICS
ELEMENTARY
MICRO LEARNINGWARE
MICRO LEARNINGWARE
$24.95
3.2/AS
THIS PACKAGE CONTAINS FOUR PROGRAMS THAT DEAL WITH DECIMALS. MULTIPLE ADDITION DRILLS,DRILLS IN ADDITION,SUBTRACTION,MULTIPLICATION AND DIVISION,AND VARIABLE SPEED DRILLS.

GRADE 1
MATHEMATICS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

GRADE 2
MATHEMATICS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

GRADE 3
MATHEMATICS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

GRADE 4
MATHEMATICS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

GRADE 5
MATHEMATICS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

GRADE 6
MATHEMATICS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

GRADE 7
MATHEMATICS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

BASIC MATH
MATHEMATICS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

SUBTRACTION FACTS
MATHEMATICS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

MULTIPICATION FACTS
MATHEMATICS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

DIVISION FACTS
MATHEMATICS
ELEMENTARY
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

LANGUAGE ARTS SEQUENCES
LANGUAGE ARTS
ELEMENTARY JUNIOR
MILLIKEN
MILLIKEN
$75.00
3.2
THIS PROGRAM CONTAINS STRUCTURED DRILL AND PRACTICE FOR STUDENTS IN LETTER RECOGNITION AND ALPHABETIZATION SKILLS.

MATHEMATICS SEQUENCES
MATHEMATICS
ELEMENTARY JUNIOR
MILLIKEN
MILLIKEN
$450.00
3.2
THIS IS A 12 DISK PACKAGE WHICH OFFERS A COMPREHENSIVE,OBJECTIVE-BASED CURRICULUM WITH STRUCTURED DRILL AND PRACTICE.

MAGIC GRID
MATHEMATICS
ELEMENTARY JUNIOR
ACCURATE INFORMATION NOT AVAILABLE
MOYER VICO CORP.
$37.50
3.2
THE STUDENT IS REQUIRED TO SOLVE A NINE CELL GRID WITH NINE BASIC ALGEBRA PROBLEMS.

NUMBER SERIES
MATHEMATICS
ELEMENTAY JUNIOR/SENIOR
ACCURATE INFORMATION NOT AVAILABLE
MOYER VICO CORP.
$40.75
3.2
THIS CONTAINS EIGHT LESSONS TO REINFORCE MATH AND LOGIC SKILLS AS WELL AS PROVIDE PRACTICE.

FRACTIONS
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR
ACCURATE INFORMATION NOT AVAILABLE
MOYER VICO CORP.
$63.30
3.2
CONTAINS:DEFINITIONS,COMMON AND LOWEST DENOMINATOR,BASIC OPERATIONS USING FRACTIONS AND MIXED NUMBERS.

DECIMALS
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR
ACCURATE INFORMATION NOT AVAILABLE
MOYER VICO CORP.
$63.30
3.2
CONTAINS:CONVERSIONS,ROUNDING OFF,PERCENTAGE AND BASIC FUNCTIONS.

LEGACY
MATHEMATICS
ELEMENTARY JUNIOR
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$19.95
3.2/IB
THE USER MUST SOLVE A MYSTERY BY USING THE MULTIPLICATION TABLES CORRECTLY.

TAKE IT
MATHEMATICS
ELEMENTARY JUNIOR
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$19.95
3.2/IB
THIS IS A DRILL GAME IN WHICH THE COMPUTER USES ADDITION,SUBTRACTION,MULTIPLICATION,AND DIVISION OF POSITIVE AND NEGATIVE INTEGERS.

BAGLES
MATHEMATICS
ELEMENTARY
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$19.95
3.2/IB
STUDENTS LEARN TO DRAW INFERENCES FROM CLUES AND DEVELOP PROBLEM SOLVING STRATEGIES.

CLOCKS
MATHEMATICS
ELEMENTARY
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$19.95
3.2/IB
THIS IS A TIME GUESSING GAME IN WHICH THE STUDENTS LEARN ABOUT THE UNITS OF TIME.

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TWENTY QUESTIONS
MATHEMATICS
ELEMENTARY JUNIOR
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$19.95
3.2/IB
THIS PROGRAM TEACHES STUDENTS ABOUT THE ">" AND "<" SIGNS, PROBLEM SOLVING AND BINARY SEARCH STRATEGIES.

KEYS
MATHEMATICS LANGUAGE ARTS
ELEMENTARY
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$19.95
3.2/IB
THIS PROGRAM IS DESIGNED TO INCREASE LETTER AND NUMBER RECOGNITION IN YOUNG CHILDREN.

FANCY FROGS
MATHEMATICS
ELEMENTARY JUNIOR
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$19.95
3.2/IB
THIS PROGRAM MAKES USE OF GRAPHICS TO DEVELOP PROBLEM SOLVING CAPABILITIES.

DRILL II
MATHEMATICS LANGUAGE ARTS
ELEMENTARY JUNIOR
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$29.95

THIS PROGRAM PROVIDES PRACTICE DRILL IN ADDITION,SUBTRACTION, MULTIPLICATION,AND DIVISION AS WELL AS SPELLING.

SCHOOL DAYS
MATHEMATICS LANGUAGE ARTS
ELEMENTARY JUNIOR
MONUMENT COMPUTER SERVICE
MONUMENT COMPUTER SERVICE
$49.95
3.2/AS & IB
THIS PROGRAM ALLOWS THE APPLE TO TEACH SPELLING AND MATH IN A UNIQUE AND CREATIVE MANNER.

ELEMENTARY-VOLUME 1 (MATHEMATICS)
MATHEMATICS
ELEMENTARY
MECC SOFTWARE
MECC SOFTWARE(IN B.C. FROM JEM RESEARCH)
$15.00
3.2
THIS PROGRAM CONTAINS A SERIES OF PROGRAMS THAT ARE DESIGNED TO ASSIST THE ELEMENTARY TEACHER IN TEACHING MATHEMATICS.

ELEMENTARY-VOLUME 4 (MATHEMATICS AND SCIENCE)
MATHEMATICS SCIENCE
ELEMENTARY
MECC SOFTWARE
MECC SOFTWARE(IN B.C. FROM JEM RESEARCH)
$15.00
3.2
THIS PROGRAM TEACHES ESTIMATING AND BASIC FACTS AS WELL AS FOOD CHAINS IN FISH AND ANIMALS,DISTANCES IN SPACE AND CONSTELLATIONS.

FRACTIONS
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$59.95
3.2/AS
THIS PROGRAM DEALS WITH MANY OF THE COMMON FRACTION OPERATIONS SUCH AS:CONVERSION,ADDITION,SUBTRACTION,ROUNDING OFF,MULTIPLICATION,DIVISION AND PERCENTAGE.

DECIMALS
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$59.95
3.2/AS
THIS PROGRAM CONTAINS MANY OF THE OPERATIONS COMMONLY EMPLOYED WHEN WORKING WITH DECIMALS.

WHAT'S THE SCORE?
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$37.50
3.2/AS
THIS PROGRAM COVERS WHAT SCORES REPRESENT AND HOW MANY MATHEMATICAL FUNCTIONS THAT CAN BE PERFORMED WITH THEM.

PATHAGOREAN PROOFS
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$37.50
3.2/AS
THE PROOFS FOR MANY PATHAGOREAN PRINCIPLES ARE PRESENTED IN A VARIETY OF DIFFERENT WAYS.

EASE
MATHEMATICS
ELEMENTARY JUNIOR
EDUTEK
EDUTEK
$50.00
3.2/
THIS IS AN INTEGRATED SYSTEM OF PROGRAMS WHICH SERVE AS AN ARITHMETIC SKILL ENHANCER.

COUNT TO 10
MATHEMATICS
ELEMENTARY
EDUTEK
EDUTEK
$19.50
3.2/
TEACHES YOUNG CHILDREN TO COUNT TO 10.

COUNTING NUMBERS LESS THAN 101
MATHEMATICS
ELEMENTARY
EDUTEK
EDUTEK
$19.50
3.2/
USES GAME PADDLES TO TEACH COUNTING UP TO 100.

COUNT BY
MATHEMATICS
ELEMENTARY
EDUTEK
EDUTEK
$19.50
3.2/
AN INTRODUCTION TO MULTIPLICATION,USING THE COUNTING OF WHOLE NUMBERS.

ADDITION FUN
MATHEMATICS
ELEMENTARY
EDUTEK
EDUTEK
$19.50
3.2/
INTERACTIVE PRACTICE IN ADDITION.

SUBTRACTION FUN
MATHEMATICS
ELEMENTARY
EDUTEK
EDUTEK
$19.50
3.2/
INTERACTIVE PRACTICE IN SUBTRACTION.

SCHOOL HOUSE FIVE
LANGUAGE ARTS MATHEMATICS
ELEMENTARY
APPLE-CATIONS
APPLE CATIONS
$14.95
3.2/
THIS IS A SERIES OF FIVE PROGRAMS WHICH INCLUDE:SPELLING WORDS ,HANGMAN,WORD FUN,ADDING COLUMNS,FRACTION PROBLEMS,AND DIVISION WITH REMAINDER.

STATISTICS
SCIENCE MATHEMATICS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$24.95
3.2/AS
THIS PROGRAM DEALS WITH MANY OF THE COMMON STATISTICAL MEASURES AND PRINCIPLES.

DIVISION FUN
MATHEMATICS
ELEMENTARY JUNIOR
EDUTEK
EDUTEK
$19.50
3.2/
INTERACTIVE PRACTICE IN DIVISION.

FINGER ABACUS
MATHEMATICS
ELEMENTARY JUNIOR
EDUTEK
EDUTEK
$19.50
3.2/
TEACHES RECOGNITION OF THE CHISANBOP FINGER POSITIONS.

A CLOCK GAME
MATHEMATICS
ELEMENTARY
EDUTEK
EDUTEK
$19.50
3.2/
THIS IS A QUIZ GAME FOR LEARNING TO TELL TIME.

TAKE 'EM
MATHEMATICS
ELEMENTARY JUNIOR SENIOR
EDUTEK
EDUTEK
$19.50
3.2/
THIS IS A COMPUTER VERSION OF THE OLD MATCHSTICK GAME OF "NIM"

WATER THE FLOWERS
MATHEMATICS
ELEMENTARY
PROGRESSIVE SOFTWARE
PROGRESSIVE SOFTWARE
$19.95
3.2/
THIS PROGRAM COVERS THE BASIC OPERATIONS FOR GRADES ONE THROUGH SIX.

SRA COMPUTER DRILL AND INSTRUCTION:MATHEMATICS
MATHEMATICS
ELEMENTARY JUNIOR
SCIENCE RESEARCH ASSOCIATES
SCIENCE RESEARCH ASSOCIATES
$250.-$475.
3.2/
THIS IS A COMPLEX SET OF PROGRAMS FOR TEACHING MATHEMATICS.

SRA COMPUTER DRILL AND INSTRUCTION:FACT TRACK
MATHEMATICS
ELEMENTARY JUNIOR
SCIENCE RESEARCH ASSOCIATES
SCIENCE RESEARCH ASSOCIATES
$75.00
3.2/
THIS IS A PROGPAM DESIGNED TO INCREASE SPEED AND ACCURACY IN THE PREFORMANCE OF ADDITION,SUBTRACTION,MULTIPLICATION AND DIVISION.

COMPUTER DRILL AND INSTRUCTION:ARITHMATIC GAMES
MATHEMATICS
ELEMENTARY
SCIENCE RESEARCH ASSOCIATES
SCIENCE RESEARCH ASSOCIATES
$120.00
3.2/
THIS IS A SET OF SIX GAMES FOR ONE OR TWO PLAYERS THAT TEACHES BASIC ARITHMETIC FACTS.

THE TALKING CALCULATOR
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR
SOFTAPE
SOFTAPE
$19.95
3.2/IB
THIS PROGRAM TURNS THE COMPUTER INTO A TALKING, 10 DIGIT CALCULATOR.

APPLE BARREL BUSHEL # 1
PROGRAMMING AIDS LANGUAAGE ARTS MATHEMATICS
ELEMENTARY JUNIOR/SENIOR
APPLE BARREL
APPLE BARREL
$29.95
3.2/AS
THIS IS A COLLECTION OF A VARIETY OF EDUCATIONAL TOOLS AND GAMES.

COLOR BAR GRAPH PROGRAM
PROGRAMMING AIDS MATHEMATICS
ELEMENTARY JUNIOR/SENIOR COLLEGE TEACHER
BILL PHMPHREY
BILL PHMPHREY
$9.95
3.2/AS
THIS PROGRAM ALLOWS THE USER TO PROGRAM COLOR BAR GRAPHS USING DECIMALS IF DESIRED.

DR. DALEY'S BEST SOFTWARE
SCIENCE MATHEMATICS LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR COLLEGE
DR. DALEY
DR. DALEY
$79.95
3.2/AS
THIS IS AN EXCELLENT VALUE CONTAINING OVER 50 PROGRAMS AT A COMBINED LIST OF OVER $400.00. THERE IS A LARGE VARIETY OF PROGRAMS WITH 50 PAGES OF DOCUMENTATION.

FOOLS SPOOL
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR
PROGRAMMAR INTERNATIONAL INC.
PROGRAMMAR INTERNATIONAL INC.
$6.95
3.2/AS
THIS IS A MATH LOGIC PROGRAM IN WHICH THE STUDENT MUST MOVE THE WHEELS IN ORDER TO GET ALL OF THEM TO ADD UP TO A CERTAIN NUMBER.

MATH TUTOR I
MATHEMATICS
ELEMENTARY JUNIOR
INSTANT SOFTWARE
INSTANT SOFTWARE
$7.95
3.2/AS
THIS PROGRAM ALLOWS THE APPLE II TO ACT AS A MATH TUTOR.

MATH TUTOR II
MATHEMATICS
ELEMENTARY JUNIOR
INSTANT SOFTWARE
INSTANT SOFTWARE
$7.95
3.2/AS
THIS IS AN ADVANCED PROGRAM FOR THE "MATH TUTOR I".

NUMBER JUMPER
MATHEMATICS
ELEMENTARY JUNIOR
PROGRAMMER SOFTWARE EXCHANGE
PROGRAMMER SOFTWARE EXCHANGE
$5.00
3.2/IB
THE STUDENT MUST PLAY THE ODDS TO ARRANGE A GROUP OF NUMBERS IN SEQUENCE IN A CERTAIN NUMBER OF MOVES.

THE MATH MACHINE
MATHEMATICS
ELEMENTARY
SOUTHWEST EDPSYCH SERVICES
SOUTHWEST EDPSYCH SERVICES
$79.95
3.2/AS
THIS PROGRAM CONTAINS MANY OF THE ARITHMETIC PROCEDURES USED BY ELEMENTARY STUDENTS.

DESCRIPTIVE STATISTICS
MATHEMATICS
SENIOR (COLLEGE)
COMPRESS
COMPRESS
$60.00
3.2
CONTAINS:MEAN,VARIANCE,STANDARD DEVIATION,STATISTICAL MEASURE,
FREQUENCY DISTRIBUTION,AND FREQUENCY TABULATION.

THE SHELL GAMES
MATHEMATICS
ELEMENTARY/JUNIOR/SENIOR
APPLE COMPUTER INC.
LOCAL DEALER

A SELECTION OF FOUR EDUCATIONAL QUIZZ GAMES.

COLLEGE PACKAGE (9 PROGRAMS)
MATHEMATICS
SENIOR (COLLEGE)
MATH SOFTWARE
MATH SOFTWARE
$125.00/PKG.
3.2
THIS PACKAGE CONTAINS NINE PROGRAMS AT THE COLLEGE LEVEL.

SUPER MATH PACKAGE (19 PROGRAMS)
MATHEMATICS
SENIOR (COLLEGE)
MATH SOFTWARE
MATH SOFTWARE
$250.00/PKG.
3.2
THIS IS A COMPLETE AND LARGE MATH PACKAGE.

BASIC SECONDARY PACKAGE (12 PROGRAMS)
MATHEMATICS
SENIOR (COLLEGE)
MATH SOFTWARE
MATH SOFTWARE
$175.00/PKG.
3.2
THIS IS A COMPLETE PROGRAM FOR THE HIGH-SCHOOL LEVEL.

MATH SKILL GAMES-REGROUPING
MATHEMATICS
ELEMENTARY JUNIOR
MENTOR SOFTWARE INC.
MENTOR SOFTWARE INC.
$79.95
3.2
USES GRAPHICS TO PROVIDE STUDENTS PRACTICE IN REGROUPING CONCEPTS.

BASIC MATH SKILL GAMES
MATHEMATICS
ELEMENTARY JUNIOR
MENTOR SOFTWARE INC.
MENTOR SOFTWARE INC.
$94.95
3.2
THIS PROGRAM PRESENTS THE VARIOUS MATH BASICS AT THREE DIFFERENT DIFFICULTY LEVELS.

MUMATH
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR (COLLEGE)
MICROSOFT
MICROSOFT

3.2
THIS IS A COMPUTER SUPPLEMENT THAT ALLOWS THE COMPUTER TO DO ALGEBRA,TRIGONOMETRY,CALCULUS,INTEGRATION,AND DIFFERENTIATION.

MATH FUN
MATHEMATICS
JUNIOR
INSTANT SOFTWARE
QUEUE
$19.95
3.2
THIS PROGRAM HAS FIVE GAMES THAT INVOLVE DECIMALS,FRACTIONS, PERCENTAGE,AREAS AND VOLUME.

FLASH CARDS
MATHEMATICS
ELEMENTARY JUNIOR
WISE OWL WORKSHOP
WISE OWL WORKSHOP
$10.00
3.2
THIS IS A MATH PRACTICE GAME THAT GIVES POINTS FOR QUICK RESPONSES.

QUADRATIC EQUATIONS
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
ENABLES THE STUDENT TO DEVELOP FACILITY IN SOLVING QUADRATIC EQUATIONS.

TRIGONOMETRY I
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
THE STUDENT DEVELOPS FACILITY IN DEALING WITH THE BASIC TRIG FUNCTIONS AND IN EMPLOYING THE LAW OF SINES AND THE LAW OF COSINES.

SIMULTANEOUS EQUATIONS (2X2)
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
ASSISTS THE STUDENT IN OBTAINING SOLUTIONS TO TWO SIMULTANEOUS LINEAR EQUATIONS.

SIMULTANEOUS EQUATIONS (3X3)
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
ASSISTS THE STUDENT IN OBTAINING SOLUTIONS TO SETS OF THREE SIMULTANEOUS EQUATIONS.

GEOMETRICAL AREAS
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH DETERMINING THE AREAS OF VARIOUS PLANE FIGURES.

TRIGONOMETRY II
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE PROPERTIES OF A RIGHT TRIANGLE AND THE SIX BASIC TRIG FUNCTIONS.

VERBAL PROBLEMS I-NUMBERS
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITHTHE SOLUTIONS TO VERBAL PROBLEMS INVOLVING NUMERICAL RELATIONSHIPS.

VERBAL PROBLEMS II-COINS
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
THESE INVOLVE NUMERICAL RELATIONSHIPS AMONG VARIOUS UNITED STATES COINS.

VERBAL PROBLEMS III-AGES
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
THESE PROBLEMS INVOLVE AGE RELATIONSHIPS.

VERBAL PROBLEMS IV-INTEREST
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
THESE PROBLEMS INVOLVE SIMPLE INTEREST RELATIONSHIPS.

VERBAL PROBLEMS V-MIXTURES
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
THESE PROBLEMS INVOLVE MIXTURE RELATIONSHIPS.

VERBAL RELATIONSHIPS VI-GEOMETRY
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
THESE PROBLEMS INVOLVE SIMPLE GEOMETRIC RELATIONSHIPS.

VERBAL PROBLEMS VII-RATES
MATHEMATICS

MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
THESE PROBLEMS INVOLVE RATE RELATIONSHIPS.

VERBAL PROBLEMS VIII-DIGITS
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
THESE PROBLEMS INVOLVE RELATIONSHIPS AMONG THE VARIOUS DIGITS OF RANDOMLY GENERATED NUMBERS.

VERBAL PROBLEMS IX-WORK
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
PROBLEMS INVOLVE RATES AT WHICH WORK MAY BE ACCOMPLISHED.

ARITHMETIC PROGRESSION I
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
TEACHES THE STUDENT TO DEAL WITH VARIOUS ARITHMETIC PROGRESSIONS.CONTAINS:THE COMMON DIFFERENCE,NTH TERM,AND THE NUMBER OF TERMS.

ARITHMETIC PROGRESSIONS II
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
TEACHES THE STUDENT TO DEAL WITH VARIOUS ARITHMETIC PROGRESSIONS.CONTAINS:THE COMMON RATIO,NTH TERM,AND THE SUM OF AN ARITHMETIC PROGRESSION.

GEOMETRIC PROGRESSIONS I
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
TEACHES THE STUDENT TO DEAL WITH VARIOUS GEOMETRIC PROGRESSIONS.CONTAINS:THE COMMON RATIO,NTH TERM,AND GEOMETRIC MEAN.

GEOMETRIC PROGRESSIONS II
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
TEACHES THE STUDENT TO DEAL WITH VARIOUS GEOMETIC PROGRESSIONS.CONTAINS:THE COMMON RATIO,NTH TERM,THE SUM OF THESE PROGRESSIONS.

TYPES OF VARIATION
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH DIRECT,INDIRECT,AND JOINT RELATIONSHIPS.

LINEAR EQUATIONS
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE SOLUTIONS TO SIMPLE LINEAR EQUATIONS FOR A SINGLE UNKNOWN.

FORMULA EVALUATION
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH ALGEBRAICALLY SOLVING A RANDOMLY GENERATED IMPLICIT RELATIONSHIP FOR SOME UNKNOWN VARIABLE.

COORDINATE GEOMETRY
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
TEACHES THE STUDENT TO DEAL WITH THE ELEMENTARY CONCEPTS OF COORDINATE GEOMETRY.

EXPONENTS AND LOGARITHMS
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS

3.2
DEALS WITH THE DEFINITION OF LOGARITHMIC EQUATIONS AND THE USE OF EXPONENTS.

VERBAL PROBLEMS X-GENERAL
MATHEMATICS
SENIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
THE PROBLEMS INVOLVE VARIOUS TYPES OF NUMERICAL RELATIONSHIPS.

DIFFERENTIATION ALGEBRAIC FUNCTIONS
MATHEMATICS
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
NO DESCRIPTION AVAILABLE.

MAXIMA/MINIMA PROBLEMS PART I
MATHEMATICS
SENIOR (COLLEGE)
VAN NOSTRAND REINHOLD LTD.
MICROPHYS PROGRAMS
$20.00
3.2
NO DESCRIPTION AVAILABLE.

MAXIMA/MINIMA PROBLEMS PART I
MATHEMATICS
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
NO DESCRIPTION AVAILABLE.

RELATIVE RATES PROBLEMS PART I
MATHEMATICS
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
NO DESCRIPTION AVAILABLE.

RELATIVE RATES PROBLEMS PART II
MATHEMATICS
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
NO DESCRIPTION AVAILABLE.

INTEGRATION OF ALGEBRAIC FUNCTIONS
MATHEMATICS
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
NO DESCRIPTION AVAILABLE.

DIFFERENTIATION OF TRIGONOMETRIC FUNCTIONS
MATHEMATICS
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
NO DESCRIPTION AVAILABLE.

INTEGRATION OF TRIGONOMETRIC FUNCTIONS
MATHEMATICS
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
NO DESCRIPTION AVAILABLE.

INTEGRATION: AREAS OF PLANE FIGURES
MATHEMATICS
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
NO DESCRIPTION AVAILABLE.

INTEGRATION: VOLUME OF SOLIDS
MATHEMATICS
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
NO DESCRIPTION AVAILABLE.

INTEGRATION: ARC LENGTHS
MATHEMATICS
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
NO DESCRIPTION AVAILABLE.

INTEGRATION: SURFACE AREAS OF SOLIDS
MATHEMATICS
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
NO DESCRIPTION AVAILABLE.

MAGIC SQUARES
MATHEMATICS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
THE STUDENT IS REQUIRED TO COMPUTE THE VALUES OF THREE ELEMENTS IN A THREE BY THREE MATRIX.

MULTIPLICATION
MATHEMATICS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
THE STUDENT LEARNS TO DEAL WITH SIMPLE MULTIPLICATION PROBLEMS

DIVISION
MATHEMATICS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
TEACHES THE STUDENT TO DEAL WITH SIMPLE DIVISION PROBLEMS
WHERE TWO TO SEVEN DIGIT INTEGERS MAY BE USED.

MODULAR ARITHMETIC
MATHEMATICS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
TEACHES THE STUDENT TO DEAL WITH ADDITION,SUBTRACTION,AND
MULTIPLICATION IN RANDOMLY GENERATED PROBLEMS.

PROPORTION PROBLEMS
MATHEMATICS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
TEACHES STUDENTS TO DEAL WITH PROBLEMS OF THE TYPE:X/A=B/C.

PERCENT PROBLEMS
MATHEMATICS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
TEACHES STUDENTS TO DEAL WITH THE SOLUTIONS TO VERBAL PROBLEMS INVOLVING PERCENT RELATIONSHIPS.

ADDITION OF FRACTIONS
MATHEMATICS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
TEACHES THE STUDENT TO DEAL WITH THE ADDITION OF RANDOMLY GENERATED FRACTIONS.

SUBTRACTION OF FRACTIONS
MATHEMATICS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
TEACHES STUDENTS TO DEAL WITH THE SUBTRACTION OF RANDOMLY GENERATED FRACTIONS.

MULTIPLICATION OF FRACTIONS
MATHEMATICS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
TEACHES THE STUDENT TO DEAL WITH THE MULTIPLICATION OF RANDOMLY GENERATED FRACTIONS.

DIVISION OF FRACTIONS
MATHEMATICS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
TEACHES THE STUDENT TO DEAL WITH THE DIVISION OF RANDOMLY GENERATED FRACTIONS.

MODE, MEDIAN, AND MEAN
MATHEMATICS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
TEACHES THE STUDENT TO STATISTICALLY ANALYZE A TABLE OF RANDOMLY GENERATED DATA.CONTAINS:GREATEST,SMALLEST,RANGE OF VALUES,MODE,MEDIAN AND MEAN.

BAR GRAPH ANALYSIS
MATHEMATICS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
TEACHES THE STUDENT TO STATISTICALLY ANALYZE A BAR GRAPH OF RANDOMLY GENERATED DATA VALUES.

DECIMALS I
MATHEMATICS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
TEACHES THE STUDENT TO DEAL WITH ADDITION AND SUBTRACTION OF DECIMALS.

DECIMALS II
MATHEMATICS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
TEACHES THE STUDENT TO DEAL WITH THE MULTIPLICATION AND DIVISION OF DECIMALS.

VERBAL PROBLEMS I-NUMERICAL RELATIONSHIPS
MATHEMATICS
JUNIOR
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
TEACHES THE STUDENT TO DEAL WITH THE SOLUTION TO VERBAL PROBLEMS INVOLVING SIMPLE NUMERICAL RELATIONSHIPS.

FUNCTION
MATHEMATICS
SENIOR (COLLEGE)
THE 6502 PROGRAM EXCHANGE
THE 6502 PROGRAM EXCHANGE
$5.00
3.2
CONTAINS:LOG,EXPONENTIAL,SINE,COSINE,TANGENT,ARCSINE,ARCCOSINE ,ARCTANGENT,AND SQUARE ROOT.

BASE
MATHEMATICS
JUNIOR/SENIOR
THE 6502 PROGRAM EXCHANGE
THE 6502 PROGRAM EXCHANGE
$5.00
3.2
THIS PROGRAM ENABLES THE COMPUTER TO PERFORM ADDITION,SUBTRACTION,MULTIPLICATION,AND DIVISION ON NUMBERS IN BASE 2 THROUGH BASE 36.

GENERAL MATHEMATICS
MATHEMATICS
JUNIOR/SENIOR (COLLEGE)
HAYDEN BOOK COMPANY INC.
HAYDEN BOOK COMPANY INC.
$14.95
3.2
THIS PROGRAM CONTAINS A WIDE VARIETY OF SUBLECTS AND APPLICATIONS FOR TEACHING AND LEARNING MATHEMATICS.

COMPLEX MATHEMATICS
MATHEMATICS
SENIOR (COLLEGE)
HAYDEN BOOK COMPANY INC.
HAYDEN BOOK COMPANY INC.
$14.95
3.2
CONTAINS:ABSOLUTE VALUE,COMPLEX ADDITION,COMPLEX SUBTRACTION, COMPLEX MULTIPLICATION,COMPLEX DIVISION,NTH ROOTS OF A COMPLEX NUMBER,COMPLEX EXPONENTIAL,COMPLEX NUMBER TO A REAL NUMBER.

INTRODUCTION TO MATHEMATICS ON THE COMPUTER
MATHEMATICS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$34.95
3.2
DESIGNED TO TEACH SLOW LEARNERS THE BASICS OF ADDITION, SUBTRACTION,MULTIPLICATION AND DIVISION WITH SIX DIFFICULTY LEVELS.AVAILABLE ON DISKETTE WITH INTRO TO DECIMALS FOR $64.90

INTRODUCTION TO DECIMALS ON THE COMPUTER
MATHEMATICS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$64.90
3.2
THIS PROGRAM COVERS THE BASICS OF DECIMALS WITH SIX LEVELS OF DIFFICULTY.AVAILABLE WITH "INTRO TO MATH" ON DISK FOR $64.90

MISSING MATH FACTS
MATHEMATICS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$34.95
3.2
THE COMPUTER DISPLAYS A PROBLEM AND OMITS ONE PART OF THE EQUATION WHICH THE STUDENT MUST ENTER.

ADD,SUBTRACT,MULTIPLY AND DIVIDE WHOLE NUMBERS
MATHEMATICS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$36.90
3.2
NO DESCRIPTION AVAILABLE

FRACTIONS-ADD,SUBTRACT,MULTIPLY AND DIVIDE
MATHEMATICS
ELEMENTARY JUNIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$36.90
3.2
NO DESCRIPTION AVAILABLE

DECIMALS AND GRAPHS AND MEAN MEDIAN AND MODE
MATHEMATICS
JUNIOR/SENIOR
EDUCATIONAL ACTIVITIES INC.
VAN NOSTRAND REINHOLD LTD.
$36.90
3.2
NO DESCRIPTION AVAILABLE

SPEED DRILL
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR
STEKETEE EDUCATIONAL SOFTWARE
STEKETEE EDUCATIONAL SOFTWARE
$17.95
3.2
THIS PROGRAM DRILLS THE STUDENT IN THE BASIC NUMBER FACTS.

REVERSE
MATHEMATICS
ELEMENTARY JUNIOR
STEKETEE EDUCATIONAL SOFTWARE
STEKETEE EDUCATIONAL SOFTWARE
$17.95
3.2
THE COMPUTER PRESENTS A SERIES OF ORDERED NUMBERS AND THEN SCRAMBLES THEM AND ASKS THE STUDENT TO REARRANGE THEM.

FRACTION RECOGNITION
MATHEMATICS
ELEMENTARY JUNIOR
STEKETEE EDUCATIONAL SOFTWARE
STEKETEE EDUCATIONAL SOFTWARE
$17.95
3.2
THIS PROGRAM MAKES EXTENSIVE USE OF HIGH RESOLUTION GRAPHICS TO TEACH A STUDENT TO RECOGNISE FRACTIONS.

GUESS THE NUMBER
MATHEMATICS
ELEMENTARY JUNIOR
STEKETEE EDUCATIONAL SOFTWARE
STEKETEE EDUCATIONAL SOFTWARE
$17.95
3.2
THE COMPUTER GUESSES A NUMBER AND THE STUDENT THEN ATTEMPTS TO GUESS THE NUMBER ACCORDING TO CERTAIN CLUES GIVEN BY THE COMPUTER.

GUESS THE RULE
MATHEMATICS
JUNIOR/SENIOR
STEKETEE EDUCATIONAL SOFTWARE
STEKETEE EDUCATIONAL SOFTWARE
$17.95
3.2
THIS IS AN ALGEBRA GUESSING GAME IN WHICH THE STUDENT MUST GUESS THE CORRECT ALGEBRAIC PRINCIPLE.

NUMBER LINE
MATHEMATICS
ELEMENTARY JUNIOR
STEKETEE EDUCATIONAL SOFTWARE
STEKETEE EDUCATIONAL SOFTWARE
$17.95
3.2
THIS PROGRAM TEACHES THE STUDENT TO WORK WITH THE BASIC METHODS OF USING POSITIVE AND NEGATIVE NUMBERS.

PLOT
MATHEMATICS
JUNIOR/SENIOR
STEKETEE EDUCATIONAL SOFTWARE
STEKETEE EDUCATIONAL SOFTWARE
$17.95
3.2
IN THIS PROGRAM THE STUDENT LEARNS TO USE A GRAPH TO PREFORM BASIC FUNCTIONS.

GRADE 8
MATHEMATICS
JUNIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

LANGUAGE ARTS SEQUENCES
LANGUAGE ARTS
ELEMENTARY JUNIOR
MILLIKEN
MILLIKEN
$75.00
3.2
THIS PROGRAM CONTAINS STRUCTURED DRILL AND PRACTICE FOR STUDENTS IN LETTER RECOGNITION AND ALPHABETIZATION SKILLS.

MATHEMATICS SEQUENCES
MATHEMATICS
ELEMENTARY JUNIOR
MILLIKEN
MILLIKEN
$450.00
3.2
THIS IS A 12 DISK PACKAGE WHICH OFFERS A COMPREHENSIVE,OBJECTIVE-BASED CURRICULUM WITH STRUCTURED DRILL AND PRACTICE.

MAGIC GRID
MATHEMATICS
ELEMENTARY JUNIOR
ACCURATE INFORMATION NOT AVAILABLE
MOYER VICO CORP.
$37.50
3.2
THE STUDENT IS REQUIRED TO SOLVE A NINE CELL GRID WITH NINE BASIC ALGEBRA PROBLEMS.

NUMBER SERIES
MATHEMATICS
ELEMENTAY JUNIOR/SENIOR
ACCURATE INFORMATION NOT AVAILABLE
MOYER VICO CORP.
$40.75
3.2
THIS CONTAINS EIGHT LESSONS TO REINFORCE MATH AND LOGIC SKILLS AS WELL AS PROVIDE PRACTICE.

FRACTIONS
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR
ACCURATE INFORMATION NOT AVAILABLE
MOYER VICO CORP.
$63.30
3.2
CONTAINS:DEFINITIONS,COMMON AND LOWEST DENOMINATOR,BASIC OPERATIONS USING FRACTIONS AND MIXED NUMBERS.

DECIMALS
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR
ACCURATE INFORMATION NOT AVAILABLE
MOYER VICO CORP.
$63.30
3.2
CONTAINS:CONVERSIONS,ROUNDING OFF,PERCENTAGE AND BASIC FUNCTIONS.

LEGACY
MATHEMATICS
ELEMENTARY JUNIOR
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$19.95
3.2/IB
THE USER MUST SOLVE A MYSTERY BY USING THE MULTIPLICATION TABLES CORRECTLY.

TAKE IT
MATHEMATICS
ELEMENTARY JUNIOR
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$19.95
3.2/IB
THIS IS A DRILL GAME IN WHICH THE COMPUTER USES ADDITION,SUBTRACTION,MULTIPLICATION,AND DIVISION OF POSITIVE AND NEGATIVE INTEGERS.

TWENTY QUESTIONS
MATHEMATICS
ELEMENTARY JUNIOR
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$19.95
3.2/IB
THIS PROGRAM TEACHES STUDENTS ABOUT THE ">" AND "<" SIGNS, PROBLEM SOLVING AND BINARY SEARCH STRATEGIES.

SQUARE BINOMIALS
MATHEMATICS
JUNIOR/SENIOR
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$19.95
3.2/IB
THIS IS A DRILL PROGRAM ON SQUARING BINOMIALS.

SLOPE
MATHEMATICS
JUNIOR/SENIOR
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$19.95
3.2/IB
PRACTICE IS PROVIDED IN THIS PROGRAM FOR SLOPE AND INTERCEPT CONCEPTS USING LINEAR EQUATIONS.

FANCY FROGS
MATHEMATICS
ELEMENTARY JUNIOR
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$19.95
3.2/IB
THIS PROGRAM MAKES USE OF GRAPHICS TO DEVELOP PROBLEM SOLVING CAPABILITIES.

DRILL II
MATHEMATICS LANGUAGE ARTS
ELEMENTARY JUNIOR
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$29.95

THIS PROGRAM PROVIDES PRACTICE DRILL IN ADDITION,SUBTRACTION, MULTIPLICATION,AND DIVISION AS WELL AS SPELLING.

SCHOOL DAYS
MATHEMATICS LANGUAGE ARTS
ELEMENTARY JUNIOR
MONUMENT COMPUTER SERVICE
MONUMENT COMPUTER SERVICE
$49.95
3.2/AS & IB
THIS PROGRAM ALLOWS THE APPLE TO TEACH SPELLING AND MATH IN A UNIQUE AND CREATIVE MANNER.

NOTAT
SCIENCE MATHEMATICS
JUNIOR/SENIOR COLLEGE
MICROPI
MICROPI
$75.00
3.2
THIS IS AN INTRODUCTION TO SCIENTIFIC NOTATION.

AESTHEOMETRY-VOLUME 1
MATHEMATICS
SENIOR
MECC SOFTWARE
MECC SOFTWARE(IN B.C. FROM JEM RESEARCH)
$15.00
3.2
THIS PROGRAM DEALS WITH CONCEPTS INVOLVED IN CURVE SKETCHING AND VARIOUS OTHER GRAPHABLE SHAPES.

NUMBER SERIES
MATHEMATICS
JUNIOR/SENIOR COLLEGE
PROGRAM DESIGN INC.
PROGRAM DESIGN INC.
$23.95
3.2/IB
THIS PROGRAM DEALS WITH THE COMMON PROBLEMS ENCOUNTERED IN DEALING WITH AND ANALYZING NUMBER SERIES.

FRACTIONS
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$59.95
3.2/AS
THIS PROGRAM DEALS WITH MANY OF THE COMMON FRACTION OPERATIONS SUCH AS:CONVERSION,ADDITION,SUBTRACTION,ROUNDING OFF,MULTIPLICATION,DIVISION AND PERCENTAGE.

DECIMALS
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$59.95
3.2/AS
THIS PROGRAM CONTAINS MANY OF THE OPERATIONS COMMONLY EMPLOYED WHEN WORKING WITH DECIMALS.

WHAT'S THE SCORE?
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$37.50
3.2/AS
THIS PROGRAM COVERS WHAT SCORES REPRESENT AND HOW MANY MATHEMATICAL FUNCTIONS THAT CAN BE PERFORMED WITH THEM.

ON THE AVERAGE
MATHEMATICS
JUNIOR/SENIOR COLLEGE

BELL & HOWELL
$37.50
3.2/AS
THIS PROGRAM REVIEWS SCORES AND VARIABLES,FREQUENCY TABLES AND FREQUENCY GRAPHS AND CURVES.

PATHAGOREAN PROOFS
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$37.50
3.2/AS
THE PROOFS FOR MANY PATHAGOREAN PRINCIPLES ARE PRESENTED IN A VARIETY OF DIFFERENT WAYS.

ALGEBRA DRILL AND PRACTICE
MATHEMATICS
JUNIOR/SENIOR COLLEGE

BELL & HOWELL
$145.00
3.2/AS
THIS PROGRAM PROVIDES A NUMBER OF DRILL AND PRACTICE OPERATIONS IN ALGEBRA.

STATISTICS PACKAGE 1.0
MATHEMATICS
SENIOR COLLEGE
ON-GOING IDEAS
ON-GOING IDEAS
$24.95
3.2
THIS PACKAGE CONTAINS SOME INTERESTING AND POWERFUL STATISTICAL ROUTINES.

EASE
MATHEMATICS
ELEMENTARY JUNIOR
EDUTEK
EDUTEK
$50.00
3.2/
THIS IS AN INTEGRATED SYSTEM OF PROGRAMS WHICH SERVE AS AN ARITHMETIC SKILL ENHANCER.

STATISTICS
SCIENCE MATHEMATICS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$24.95
3.2/AS
THIS PROGRAM DEALS WITH MANY OF THE COMMON STATISTICAL MEASURES AND PRINCIPLES.

DIVISION FUN
MATHEMATICS
ELEMENTARY JUNIOR
EDUTEK
EDUTEK
$19.50
3.2/
INTERACTIVE PRACTICE IN DIVISION.

FINGER ABACUS
MATHEMATICS
ELEMENTARY JUNIOR
EDUTEK
EDUTEK
$19.50
3.2/
TEACHES RECOGNITION OF THE CHISANBOP FINGER POSITIONS.

TAKE 'EM
MATHEMATICS
ELEMENTARY JUNIOR SENIOR
EDUTEK
EDUTEK
$19.50
3.2/
THIS IS A COMPUTER VERSION OF THE OLD MATCHSTICK GAME OF "NIM"

GENERAL MATHEMATICS
MATHEMATICS
JUNIOR/SENIOR COLLEGE
HAYDEN BOOK COMPANY
HAYDEN BOOK COMPANY
$14.95
3.2/
THIS PROGRAM CONTAINS THIRTEEN PROGRAMS OF THE VARIETY FOUND IN MOST ADVANCED HIGH-SCHOOL COURSES.

COMPLEX MATHEMATICS
MATHEMATICS
SENIOR COLLEGE
HAYDEN BOOK COMPANY
HAYDEN BOOK COMPANY
$14.95
3.2/
THIS DEALS WITH MANY OF THE SUBJECT AREAS THAT ARE COVERED IN HIGH-SCHOOL MATHEMATICS.

FUNCTION GRAPHS AND TRANSFORMATIONS
MATHEMATICS
JUNIOR/SENIOR
POWERSOFT
POWERSOFT
$14.95
3.2/
THIS IS AN APPROACH TO ALGEBRA,TRIGONOMETRY,AND ANALYTIC GEOMETRY.

APPLE BASIC STATISTICS
MATHEMATICS
JUNIOR/SENIOR
POWERSOFT
POWERSOFT
$9.95
3.2/
THIS PROGRAM CONTAINS MANY OF THE INTRODUCTORY STATISTICAL MEASURES.

CATCH THE PIG
MATHEMATICS
JUNIOR/SENIOR
PROGRESSIVE SOFTWARE
PROGRESSIVE SOFTWARE
$16.95
3.2/
TEACHES UP TO FOUR STUDENTS AT A TIME THE CARTESIAN COORDINATE SYSTEM.

POLAR COORDINATE PLOT
MATHEMATICS
SENIOR COLLEGE
PROGRESSIVE SOFTWARE
PROGRESSIVE SOFTWARE
$9.95
3.2
FIVE CLASSIC POLAR COORDINATES ARE PROVIDED AND THE USER CAN MAKE UP THEIR OWN.

CURVE FIT
MATHEMATICS
SENIOR COLLEGE
PROGRESSIVE SOFTWARE
PROGRESSIVE SOFTWARE
$9.95
3.2/
THE COMPUTER TAKES ANY NUMBER OF DATA POINTS AND MAKES THEM FIT A SPECIFIC TYPE OF CURVE.

CLASSROOM MANAGEMENT SYSTEM:MATHEMATICS
TEACHER AIDS MATHEMATICS
JUNIOR/SENIOR
SCIENCE RESEARCH ASSOCIATES
SCIENCE RESEARCH ASSOCIATES
$595.00
3.2/
THIS IS A SYSTEM FOR DIAGNOSING,PRESCRIBING,AND RECORDKEEPING
IN MATHEMATICS.

SRA COMPUTER DRILL AND INSTRUCTION:MATHEMATICS
MATHEMATICS
ELEMENTARY JUNIOR
SCIENCE RESEARCH ASSOCIATES
SCIENCE RESEARCH ASSOCIATES
$250.-$475.
3.2/
THIS IS A COMPLEX SET OF PROGRAMS FOR TEACHING MATHEMATICS.

SRA COMPUTER DRILL AND INSTRUCTION:FACT TRACK
MATHEMATICS
ELEMENTARY JUNIOR
SCIENCE RESEARCH ASSOCIATES
SCIENCE RESEARCH ASSOCIATES
$75.00
3.2/
THIS IS A PROGRAM DESIGNED TO INCREASE SPEED AND ACCURACY IN
THE PREFORMANCE OF ADDITION,SUBTRACTION,MULTIPLICATION AND
DIVISION.

INTERACTIVE STATISTICS
MATHEMATICS
SENIOR COLLEGE
SERENDIPITY SYSTEMS INC.
MFC MICROCOMPUTER CORP.

3.2/
THIS IS A USEFUL TOOL FOR PREFORMING MANY OF THE MATHEMATICAL
FUNCTIONS OF THE HIGHER LEVELS.

THE TALKING CALCULATOR
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR
SOFTAPE
SOFTAPE
$19.95
3.2/IB
THIS PROGRAM TURNS THE COMPUTER INTO A TALKING, 10 DIGIT CALCULATOR.

GEOMETRY AND MEASUREMENT
MATHEMATICS
JUNIOR/SENIOR
SPECIAL DELIVERY SOFTWARE
SPECIAL DELIVERY SOFTWARE
$50.00
3.3/AS
THIS PROGRAM PROVIDES DRILL AND PRACTICE FOR VARIOUS GEOMETRY AND MEASUREMENT PRINCIPLES.

NUMERICAL ANALYSIS
MATHEMATICS
SENIOR COLLEGE
SPECTRUM SOFTWARE
SPECTRUM SOFTWARE
$19.95
3.2/AS
THIS IS A TWO DIMENSIONAL PLOT OF ANY FUNCTION WITH SCALING.

3-D SURFACE PLOTTER
MATHEMATICS GEOGRAPHY
SENIOR COLLEGE
SPECTRUM SOFTWARE
SPECTRUM SOFTWARE
$19.95
3.2/AS
ANY THREE DIMENSIONAL SURFACE CAN BE PLOTTED FROM ANY THREE VARIABLE EQUATION.

NUMBER SERIES
MATHEMATICS
JUNIOR/SENIOR
TRANS DATA CORP.
TRANS DATA CORP.
$9.50
3.2/AS
THIS PROGRAM SHOWS A METHOD OF SOLVING NUMBER SERIES PROBLEMS AND PROVIDES PRACTICE.

APPLE BARREL BUSHEL # 1
PROGRAMMING AIDS LANGUAAGE ARTS MATHEMATICS
ELEMENTARY JUNIOR/SENIOR
APPLE BARREL
APPLE BARREL
$29.95
3.2/AS
THIS IS A COLLECTION OF A VARIETY OF EDUCATIONAL TOOLS AND GAMES.

COLOR BAR GRAPH PROGRAM
PROGRAMMING AIDS MATHEMATICS
ELEMENTARY JUNIOR/SENIOR COLLEGE TEACHER
BILL PHMPHREY
BILL PHMPHREY
$9.95
3.2/AS
THIS PROGRAM ALLOWS THE USER TO PROGRAM COLOR BAR GRAPHS USING DECIMALS IF DESIRED.

FOOLS SPOOL
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR
PROGRAMMAR INTERNATIONAL INC.
PROGRAMMAR INTERNATIONAL INC.
$6.95
3.2/AS
THIS IS A MATH LOGIC PROGRAM IN WHICH THE STUDENT MUST MOVE THE WHEELS IN ORDER TO GET ALL OF THEM TO ADD UP TO A CERTAIN NUMBER.

MATH TUTOR I
MATHEMATICS
ELEMENTARY JUNIOR
INSTANT SOFTWARE
INSTANT SOFTWARE
$7.95
3.2/AS
THIS PROGRAM ALLOWS THE APPLE II TO ACT AS A MATH TUTOR.

MATH TUTOR II
MATHEMATICS
ELEMENTARY JUNIOR
INSTANT SOFTWARE
INSTANT SOFTWARE
$7.95
3.2/AS
THIS IS AN ADVANCED PROGRAM FOR THE "MATH TUTOR I".

NUMBER JUMPER
MATHEMATICS
ELEMENTARY JUNIOR
PROGRAMMER SOFTWARE EXCHANGE
PROGRAMMER SOFTWARE EXCHANGE
$5.00
3.2/IB
THE STUDENT MUST PLAY THE ODDS TO ARRANGE A GROUP OF NUMBERS IN SEQUENCE IN A CERTAIN NUMBER OF MOVES.

MATHEMATICS SERIES
MATHEMATICS
SENIOR COLLEGE
SPECTRUM SOFTWARE
SPECTRUM SOFTWARE
$49.95
3.2/AS
CONTAINS:MEAN,STANDARD DEVIATION,FREQUENCY DISTRIBUTION,PLOT, SIMPLE LINEAR REGRESSION LINE,SLR EQUATION CO-EFFICIENT,AND DATA POINTS.

MUSIC II
MUSIC
SENIOR/TEACHER
MICROPRODUCTS
MICROPRODUCTS

3.2 OR 3.3
THIS PROGRAM ALLOWS THE COMPUTER TO ACT AS A SOPHISTICATED
MUSIC SYNTHESIZER.

MUSICAL COMPUTER ONE AND TWO
MUSIC
ELEMENTARY JUNIOR/SENIOR
COMPUTER APPLICATIONS TOMORROW
COMPUTER APPLICATIONS TOMORROW
$34.95
3.2
THIS PROGRAM CONTAINS MANY OF THE BASIC LESSONS IN MUSIC AS
WELL AS SOME OF THE MORE ADVANCED.THIS IS A TWO PART PROGRAM.

MUSIC COMPOSER
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$205.00
3.2
THIS IS A MUSIC COMPOSING AID THAT ALLOWS THE COMPOSER TO
PRINT AND SAVE MUSIC ON A DISKETTE.

MUSIC COMPOSER LIBRARY
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$115.00
3.2
THESE ARE A NUMBER OF PROGRAMS THAT WILL ADD TO THE CAPABILITIES OF THE MUSIC COMPOSER.

ENVELOPE SHAPER
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$40.00
3.2
THIS PROGRAM IS DESIGNED TO TAKE MUSIC COMPOSED BY THE STUDENT AND PLAY THAT MUSIC WITH THE PRESET INSTRUMENTAL SHAPES.

ENVELOPE CONSTRUCTION
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$57.00
3.2
ALLOWS THE ACTUAL DESIGN AND CONSTRUCTION OF MUSICAL TIMBRES BY PLOTTING THE ENVELOPE OF EACH HARMONIC IN A SOUND.

TUNING AND TEMPERAMENT CONSTRUCTION
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$57.00
3.2
ALLOWS YOU TO DEVELOP AND LISTEN TO YOUR OWN TUNINGS AS WELL AS EXAMINE ALL EXISTING TUNINGS AND TEMPERAMENT.

MICRO MUSIC DIGISONG PAKS
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$22.00
3.2
THESE ARE A VARIETY OF DISKS THAT ARE EXAMPLES OF AMERICAN CULTURE.

AUTO DIGISONG PLAYER
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$45.00
3.2
ENABLES PROGRAMMING OF TIMBRE,TEMPO,AND OTHER PERAMENTERS FOR FULLY AUTOMATED PERFORMANCES OF COMPOSITIONS.

EXPERIMENTER'S PACKAGE
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$230.00
3.2
THIS PROGRAM ALLOWS THE TEACHER TO TAILOR PROGRAMS TO THE SPECIFIC NEEDS OF THE STUDENT.

MELODIOUS DICTATOR
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$136.00
3.2
A PROGRAM DESIGNED TO TEACH STUDENTS TO HEAR SINGLE LINE MELODIES AND TO NOTATE THESE ON A TRADITIONAL TREBLE CLEF STAFF.

RYTHMIC DICTATOR
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$136.00
3.2
TEACHES YOU TO HEAR BASIC RYTHMIC PATTERNS AND TO NOTATE THESE ON A ONE LINE RHYTHMIC STAFF.

HARMONIOUS DICTATOR
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$136.00
3.2
AN INTERACTIVE APPROACH TO THE PERCEPTION OF CHORDS AND CHORD STRUCTURES WITHIN THE SAME FORMAT AS THE MELODIOUS AND RHYTHMIC DICTATOR.

INTERVAL MANIA
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$136.00
3.2
TEACHES BOTH VISUAL AND AURAL IDENTIFICATION OF MUSIC INTERVALS IN A GAME CONTEXT WHERE ONE OR TWO PLAYERS CAN TRY TO BEAT THE CLOCK WITH THEIR SKILLS.

CHORD MANIA
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$136.00
3.2
SIMILAR TO THE INTERVAL MANIA,BUT DESIGNED TO TRAIN THE STUDENT'S EAR TO UNDERSTAND AND RECOGNISE CHORDS.

MUSIC LOVER'S GUIDE TO COMPOSERS
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$57.00
3.2
SPELLING RECOGNITION AND RECALL OF BASIC INFORMATION PRESENTED IN A CHALLENGING,INTERACTIVE FORMAT.

MUSIC LOVER'S GUIDE TO MUSICAL SYMBOLS
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$57.00
3.2
SPELLING RECOGNITION AND RECALL OF BASIC INFORMATION PRESENTED
IN A CHALLENGING,INTERACTIVE FORMAT.

MUSIC LOVER'S GUIDE TO ITALIAN TERMS
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$57.00
3.2
SPELLING RECOGNITION AND RECALL OF BASIC INFORMATION PRESENTED
IN A CHALLENGING,INTERACTIVE FORMAT.

MUSIC LOVER'S GUIDE TO MUSICAL INSTUMENTS
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$57.00
3.2
SPELLING RECOGNITION AND RECALL OF BASIC INFORMATION PRESENTED
IN A CHALLENGING,INTERACTIVE FORMAT.

MUSIC LOVER'S GUIDE TO GENERAL MUSIC TERMS
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$57.00
3.2
SPELLING RECOGNITION AND RECALL OF BASIC INFORMATION PRESENTED
IN A CHALLENGING,INTERACTIVE FORMAT.

MUSIC LOVER'S GUIDE FOR TEACHERS
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$57.00
3.2
SPELLING RECOGNITION AND RECALL OF BASIC INFORMATION PRESENTED IN A CHALLENGING,INTERACTIVE FORMAT.

MAESTRO'S MAGIC SPELLER
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$35.00
3.2
LEARN TO SPELL MUSICAL NAMES,TERMS,COMPOSERS AND SYMBOLS.

MUSIC IN THEORY AND PRACTICE:A SUPPLEMENT
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$250.00
3.2
A COMPREHENSIVE SUPPLEMENT TO THE NATIONALLY RECOGNISED TEXT.

DOREMI
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$57.00
3.2
TEACHES STUDENTS TO IDENTIFY (BY SOUND ONLY)THE INDIVIDUAL DEGREES OF A MAJOR SCALE USING SCALE DEGREES OR SOLFEGGIO RESPONSES.

NAME THAT TUNE
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$57.00
3.2
TEACHES THE STUDENT TO IDENTIFY (BY SOUND) THE DEGREES OF THE SCALE USING SOLFEGGIO SYLLABLES OR SCALE DEGREE NUMBERS.

SIR WILLIAM WRONG NOTE
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$136.00
3.2
DESIGNED TO TEACH IDENTIFICATION OF WRONG NOTES IN THE HARMONIC CONTEXT OF A FOUR VOICED CHORD.

ARNOLD
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
MICRO MUSIC INC.
MICRO MUSIC INC.
$57.00
3.2
THIS PROGRAM IS DESIGNED TO TEACH TONE RECOGNITION AND MELODIC MEMORY SKILLS.

KEYBOARD FUN
MUSIC
ELEMENTARY
EDUTEK
EDUTEK
$19.50
3.2/
THIS IS AN INTRODUCTION TO THE COMPUTER KEYBOARD FOR CHILDREN.

MUSIC #1-PLAY A TUNE
MUSIC
ELEMENTARY JUNIOR/SENIOR
EDUTEK
EDUTEK
$19.50
3.2/
THE STUDENTS PICK NOTES USING THE GAME PADDLES AND THE COMPUTER THEN PLAYS THEM BACK WITH A COLOR SHOW.

MUSIC #2-FIND THE KEY
MUSIC
ELEMENTARY JUNIOR
EDUTEK
EDUTEK
$19.50
3.2/
TEACHES STUDENTS THE NAMES OF THE PIANO KEYS.

MUSIC DRILL #4
MUSIC
ELEMENTARY JUNIOR
EDUTEK
EDUTEK
$19.50
3.2/
TEACHES STUDENTS TO FIND THE PIANO KEYS ON A 32 NOTE BOARD.

SONGS IN THE KEY OF APPLE
MUSIC
ELEMENTARY JUNIOR/SENIOR
HAYDEN BOOK COMPANY
HAYDEN BOOK COMPANY
$10.95
3.2/
THIS ALLOWS THE STUDENT TO CREATE SONGS USING THE COMPUTER.

156

MUSIC BOX
MUSIC
JUNIOR/SENIOR
MICRO USERS SOFTWARE EXCHANGE
MICRO USERS SOFTWARE EXCHANGE
$12.95
3.2/
THIS PROGRAM TURNS THE COMPUTER INTO A THREE OCTAVE MUSICAL INSTRUMENT.

MUSIC COMPOSITION
MUSIC
JUNIOR/SENIOR COLLEGE
RICHARD W. KING
RICHARD W. KING
$20.00
3.2/
THIS PROGRAM ALLOWS THE APPLE TO ACT AS A MUSIC COMPOSER.

MUSICOMP
MUSIC
ELEMENTARY JUNIOR/SENIOR COLLEGE
SPECIAL DELIVERY SOFTWARE
SPECIAL DELIVERY SOFTWARE
$45.00
3.3/AS
THIS PROVIDES AN ELECTRONIC SHEET ON WHICH YOU CAN COMPOSE, ARRANGE,STORE,AND PLAY YOUR OWN MUSIC.

ECHO
MUSIC
ELEMENTARY JUNIOR
PROGRAMMAR INTERNATIONAL INC.
PROGRAMMAR INTERNATIONAL INC.
$6.95
3.2/AS
THIS IS A PROGRAM WHERE THE STUDENT HEARS THE COMPUTER PLAY THE NOTES AND THE STUDENT MUST PRESS THE CORRESPONDING KEY TO REPLAY THE MELODY.

LANGUAGE DRILL
LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR
SOFT-ONE
SOFT-ONE
$7.50
3.2/AS
THIS IS A PROGRAM THAT CAN BE USED FOR DRILLING THE STUDENT IN ANY LANGUAGE THAT THE STUDENT ENTERS.

APPLE PLOT
PROGRAMMING AIDS
TEACHER
BELL AND HOWELL
BELL AND HOWELL

3.2
THIS ALLOWS THE COMPUTER TO CREATE,REVISE,AND PRINT HIGHLY DETAILED CHARACTERS AND GRAPHS QUICKLY AND EASILY.

LIGHT PEN QUIZ
TEACHER AIDS/PROGRAMMING AIDS
TEACHER
CHARLES MANN AND ASSOCIATES
CHARLES MANN AND ASSOCIATES
$49.95
3.2
ALLOWS THE TEACHER TO CREATE AND EDIT CAI QUIZZES WHICH STUDENTS MAY TAKE USING THE "LIGHT PEN" AS THE INPUT TOOL.

APPLE FORTRAN
PROGRAMMING AIDS, SCIENCE, MATHEMATICS
TEACHER (COLLEGE)
APPLE COMPUTER INC.
LOCAL DEALER

3.2
FORTRAN IS A POWERFUL PROGRAMMING LANGUAGE,ESPECIALLY SUITABLE FOR WORK IN MATHEMATICS,ENGINEERING AND THE SCIENCES.

APPLE WRITER
PROGRAMMING AIDS
TEACHER
APPLE COMPUTER INC.
LOCAL DEALER

3.2
THIS PRODUCT ENABLES THE COMPUTER TO ACT AS A TEXT EDITOR.

APPLE PILOT
PROGRAMMING AIDS
TEACHER (COLLEGE)
APPLE COMPUTER INC.
LOCAL DEALER

3.2
AN EASY TO USE SYSTEM DESIGNED TO SUPPORT PROGRAM DEVELOPMENT FOR CAI.

THE BRAIN SURGEON
PROGRAMMING AIDS
TEACHER
NIKROM TECHNICAL PRODUCTS
NIKROM TECHNICAL PRODUCTS
$39.95
3.2 OR 3.3/AS
THIS DIAGNOSTIC TOOL WAS DESIGNED TO CHECK EVERY MAJOR AREA OF THE COMPUTER AND TO DETECT ERRORS AND REPORT MALFUNCTIONS.

WATANABE CURVE PROGRAM
PROGRAMMING AIDS, TEACHER AIDS, MATHEMATICS
TEACHER (COLLEGE)
WEST COAST CONSULTANTS
WEST COAST CONSULTANTS

3.2
ENABLES THE COMPUTER TO DO A NUMBER OF MATHEMATICAL FUNCTIONS AND DISPLAY THEM GRAPHICALLY.

WATANABE PLOTTER PROGRAM
PROGRAMMING AIDS, TEACHER AIDS, MATHEMATICS
TEACHER (COLLEGE)
WEST COAST CONSULTANTS
WEST COAST CONSULTANTS

3.2
THIS PROGRAM WILL:PLOT SURFACE FUNCTIONS,PLOT X,Y,Z DATA ARRAYS,PLOT "SPACE" CURVES,ROTATE THROUGH 360 DEGREES,AND SCALED AXES AND LABELING.

CHARACTER GENERATOR
PROGRAMMING AIDS
TEACHER
STEKETEE EDUCATIONAL SOFTWARE
STEKETEE EDUCATIONAL SOFTWARE
$17.95
3.2
THIS PROGRAM ALLOWS THE USER TO PUT TEXT ONTO THE APPLE'S HIGH RESOLUTION SCREEN.

THE CREATOR
PROGRAMMING AIDS
TEACHER
COMPLETE BUSINESS SYSTEMS INC.
COMPLETE BUSINESS SYSTEMS INC.
$250.00
3.2
THIS IS A HIGH LEVEL LANGUAGE PROGRAM GENERATOR WHICH DEVELOPS COMPLETE PROGRAMS IN BASIC.

PILOT
PROGRAMMING AIDS
TEACHER
COOK'S COMPUTER COMPANY
COOK'S COMPUTER COMPANY
$25.00

THIS PROGRAM MAKES IT EASIER TO WRITE PROGRAMS.

A2-3D1 ANIMATION PACKAGE
PROGRAMMING AIDS
TEACHER
SUBLOGIC
SUBLOGIC
$55.00
3.2
THIS PACKAGE ALLOWS SOPHISTICATED AND SIMPLE ANIMATION TO BE USED ON THE APPLE COMPUTER.

APPLE II ANIMATION PACKAGE
PROGRAMMING AIDS
TEACHER
SUBLOGIC
SUBLOGIC
$55.00
3.2
THIS PROGRAM ALLOWS FOR EASY ANIMATION WITHIN THE APPLE COMPUTER FORMAT.

PROGRAMMER'S AID-VOLUME 1
PROGRAMMING AIDS
TEACHER
MECC SOFTWARE
MECC SOFTWARE(IN B.C. FROM JEM RESEARCH)
$15.00
3.2
THIS ALLOWS THE COMPUTER TO DO MANY FUNCTIONS THAT ARE NECESSARY TO CONDUCT SUCCESSFUL PROGRAMMING.

SHAPE TABLES-VOLUME 1
PROGRAMMING AIDS
TEACHER
MECC SOFTWARE
MECC SOFTWARE(IN B.C. FROM JEM RESEARCH)
$15.00
3.2
THESE ARE A SERIES OF SHAPES THAT CAN BE INCORPORATED INTO THE USER'S PROGRAM FOR VARIOUS REASONS.

LINKER
PROGRAMMING AIDS
TEACHER
QUALITY SOFTWARE
QUALITY SOFTWARE
$49.95
3.2
THIS PROGRAM WILL TURN YOUR APPLE INTO A PRODUCTIVE SOFTWARE-DEVELOPMENT MACHINE.

MICRO ED
PROGRAMMING AIDS TEACHER AIDS
TEACHER
COMPUMAX INC.
COMPUMAX INC.

3.2
THIS PROGRAM ALLOWS THE COMPUTER TO ACT AS A COURSE WRITING AND COURSE TAKING MACHINE.

THE VOICE
PROGRAMMING AIDS TEACHER AIDS
JUNIOR/SENIOR COLLEGE

BELL & HOWELL
$65.00
3.2/AS OR IB
THIS PROGRAM GIVES THE POWER OF SPEECH TO THE COMPUTER.

APPILOT EDU-DISK
PROGRAMMING AIDS TEACHER AIDS
TEACHER

BELL & HOWELL
$160.00
3.2/IB
THIS PACKAGE CONTAINS A VARIETY OF EDUCATIONAL AIDS TO MAKE THE TEACHER'S LESSON MORE INTERESTING.

BASIC TUTOR I
PROGRAMMING AIDS
JUNIOR/SENIOR COLLEGE
RICHARD W. KING
RICHARD W. KING
$15.00
3.2/
THIS IS A SERIES OF STUDIES ON PROGRAMMING THE APPLE IN BASIC ASSUMING THE USER HAS NO COMPUTER BACKGROUND.

BASIC TUTOR II
PROGRAMMING AIDS
JUNIOR/SENIOR COLLEGE
RICHARD W. KING
RICHARD W. KING
$15.00
3.2
THIS IS A CONTINUATION OF THE "BASIC TUTOR I".

COMPUTER DISCOVERY
PROGRAMMING AIDS
JUNIOR/SENIOR
SCIENCE RESEARCH ASSOCIATES
SCIENCE RESEARCH ASSOCIATES
$125.00
3.2/
THIS IS A PROGRAM TO INTRODUCE HIGH-SCHOOL STUDENTS TO THE BASIC COMPUTER CONCEPTS.

APPLESOFT BASIC TUTORIALS
PROGRAMMING AIDS
JUNIOR/SENIOR COLLEGE
STERLING SWIFT PUBLISHING CO.
STERLING SWIFT PUBLISHING CO.
$74.95
3.2/AS
THIS IS A SERIES OF TWELVE TUTORIALS ON USING AND PROGRAMMING THE APPLE.

APPLE BARREL BUSHEL # 1
PROGRAMMING AIDS LANGUAAGE ARTS MATHEMATICS
ELEMENTARY JUNIOR/SENIOR
APPLE BARREL
APPLE BARREL
$29.95
3.2/AS
THIS IS A COLLECTION OF A VARIETY OF EDUCATIONAL TOOLS AND GAMES.

COLOR BAR GRAPH PROGRAM
PROGRAMMING AIDS MATHEMATICS
ELEMENTARY JUNIOR/SENIOR COLLEGE TEACHER
BILL PHMPHREY
BILL PHMPHREY
$9.95
3.2/AS
THIS PROGRAM ALLOWS THE USER TO PROGRAM COLOR BAR GRAPHS USING DECIMALS IF DESIRED.

TELLSTAR
SCIENCE
ELEMENTARY JUNIOR/SENIOR (COLLEGE)
SCHARF SOFTWARE SERVICES
SCHARF SOFTWARE SERVICES
$79.95/39.95
3.2/ASB
THIS PROGRAM CONTAINS AN EXTREMELY WIDE VARIETY OF PROGRMS FOR ASTRONOMERS.IT USES HIGH RESOLUTION GRAPHICS TO LOCATE,IDENTIFY AND PROVIDE INFORMATION ON STELLAR OBJECTS.

PLANTS/ECOLOGY
SCIENCE
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

DIGESTION/CIRCULATION
SCIENCE
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

ELEMENTARY-VOLUME 4 (MATHEMATICS AND SCIENCE)
MATHEMATICS SCIENCE
ELEMENTARY
MECC SOFTWARE
MECC SOFTWARE(IN B.C. FROM JEM RESEARCH)
$15.00
3.2
THIS PROGRAM TEACHES ESTIMATING AND BASIC FACTS AS WELL AS FOOD CHAINS IN FISH AND ANIMALS,DISTANCES IN SPACE AND CONSTELLATIONS.

PERCEPTION
SCIENCE
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$29.95
3.2/AS
THIS PROGRAM CONTAINS THREE SEPERATE PERCEPTION EXPERIMENTS.

STATISTICS
SCIENCE MATHEMATICS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$24.95
3.2/AS
THIS PROGRAM DEALS WITH MANY OF THE COMMON STATISTICAL MEASURES AND PRINCIPLES.

METRI-VERT
SCIENCE
ELMENTARY JUNIOR/SENIOR

BELL & HOWELL
$24.95
3.2/AS
THIS IS A PROGRAM DESIGNED TO MAKE METRIC CONVERSION EASY.

CIRCULATION (ORGANS)
SCIENCE
ELEMENTARY JUNIOR/SENIOR COLLEGE

BELL & HOWELL
$37.50
3.2/AS
THIS PROGRAM INTRODUCES THE BLOOD CIRCULATION SYSTEM AND THE HUMAN ORGANS IN AN INTERESTING AND INFORMATIVE WAY.

SIMPLE MACHINES
SCIENCE
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$37.50
3.2/AS
THE PRINCIPLES AND APPLICATIONS OF SIX SIMPLE MACHINES ARE PRESENTED AND DISCUSSED.

SCIENTIFIC METHOD
SCIENCE
ELEMENTARY JUNIOR/SENIOR COLLEGE

BELL & HOWELL
$24.95
3.2/AS
THIS PROGRAM ADDRESSES THE FOLLOWING TOPPICS:OBSERVATION, GENERALIZATION,MEASUREMENT AND VERIFICATION.

DR. DALEY'S BEST SOFTWARE
SCIENCE MATHEMATICS LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR COLLEGE
DR. DALEY
DR. DALEY
$79.95
3.2/AS
THIS IS AN EXCELLENT VALUE CONTAINING OVER 50 PROGRAMS AT A COMBINED LIST OF OVER $400.00. THERE IS A LARGE VARIETY OF PROGRAMS WITH 50 PAGES OF DOCUMENTATION.

HUMAN FEMALE REPRODUCTIVE CYCLES
SCIENCE COUNSELLING AIDS
ELEMENTARY JUNIOR/SENIOR
COMPRESS
COMPRESS
$50.00
3.2/AS
CONTAINS:SELF-GENERATION,INDUCED OR ANNUAL,FERTILE,INFERTILE AND SUPPRESSED.

FOOLS SPOOL
MATHEMATICS
ELEMENTARY JUNIOR/SENIOR
PROGRAMMAR INTERNATIONAL INC.
PROGRAMMAR INTERNATIONAL INC.
$6.95
3.2/AS
THIS IS A MATH LOGIC PROGRAM IN WHICH THE STUDENT MUST MOVE THE WHEELS IN ORDER TO GET ALL OF THEM TO ADD UP TO A CERTAIN NUMBER.

COLOR LIFE GAME
SCIENCE
ELEMENTARY JUNIOR/SENIOR
AGENT COMPUTER SERVICES
AGENT COMPUTER SERVICES
$11.50
3.2/AS
THIS IS THE TRADITIONAL LIFE GAME IN WHICH COLOR GRAPHICS ARE USED TO REPRESENT THE GENERATIONS.

GROWTH
SCIENCE
JUNIOR/SENIOR (COLLEGE)
COMPRESS
COMPRESS
$50.00
3.2
TEACHES GROWTH IN POPULATIONS AND ORGANISMS TO DISCOVER FACTS ABOUT THE RELATION BETWEEN ENVIRONMENT AND SIZE CHANGE IN POPULATIONS OR ORGANS.

BIOBITS (MAGIC FLAG)
SCIENCE
SENIOR (COLLEGE)
COMPRESS
COMPRESS
$25.00
3.2
CONTAINS:FINITE MATHEMATICS,ELEMENTARY PHYSICS,INTRODUCTORY COLLEGE AND HIGH-SCHOOL BIOLOGY,GENETICS AND EVOLUTION.

BIOBITS (INTERACTIONS)
SCIENCE
JUNIOR/SENIOR (COLLEGE)
COMPRESS
COMPRESS
$50.00
3.2
HIGH-SCHOOL AND COLLEGE LEVEL INTRODUCTORY BIOLOGY AND ECOLOGY ,ENVIRONMENTAL STUDIES,POLICY STUDIES,AND ECONOMICS.

BIOBITS (PROFILE)
SCIENCE
SENIOR (COLLEGE)
COMPRESS
COMPRESS
$50.00
3.2
INTRODUCTORY BIOLOGY AND ECOLOGY,ANTHROPOLOGY,SOCIOLOGY, HISTORY,POLICY STUDIES AND ECONOMICS.

BIOBITS (EVOLUTION)
SCIENCE
SENIOR (COLLEGE)
COMPRESS
COMPRESS
$80.00
3.2
CONTAINS:EVOLUTION STUDIES USING THE HARDY-WIENBERG MODEL, GENETIC DRIFT,PALINGENESIS,AND ALLOMETRIC GROWTH.

NUCLEIC ACID CONNECTION
SCIENCE
SENIOR (COLLEGE)
COMPRESS
COMPRESS
$60.00
3.2
ILLUSTRATES TRANSCRIPTION AND TRANSLATION OF DNA IN CHROMOSOMES INTO MRNA AND POLYPEPTIDES.

BIOBITS (LIFE +)
SCIENCE
SENIOR (COLLEGE)
COMPRESS
COMPRESS
$50.00
3.2
CONTAINS:PASSIVE GROWTH,ACTIVE GROWTH,SIMPLE CHANGE AND DIFERENTIATION.

MILLIKAN
SCIENCE
JUNIOR/SENIOR (COLLEGE)
MENTOR SOFTWARE INC.
MENTOR SOFTWARE INC.
$19.95
3.2
DEMONSTRATES THE PHYSICS CONCEPTS BEHIND THE MILLIKAN OIL DROP EXPERIMENT.

TITRATION
SCIENCE
JUNIOR/SENIOR (COLLEGE)
MENTOR SOFTWARE INC.
MENTOR SOFTWARE INC.
$19.95
3.2
THIS PROGRAM SIMULATES A TYPICAL ACID/BASE TITRATION THAT CAN BE CONTROLLED AND MANIPULATED.

INTRODUCTION TO MICROCOMPUTERS
COMPUTER SCIENCE
JUNIOR/SENIOR
MENTOR SOFTWARE INC.
MENTOR SOFTWARE INC.
$54.95
3.2
THIS IS DESIGNED TO AID STUDENTS IN AQUIRING BASIC KNOWLEDGE AND SKILLS WITH MICROCOMPUTERS.

CHEMISTRY WITH A COMPUTER
SCIENCE
SENIOR (COLLEGE)
PROGRAMS FOR LEARNING INC.
PROGRAMS FOR LEARNING INC.
$100.00
3.2
THIS PROGRAM CONTAINS MANY OF THE PRINCIPLES FOUND IN THE HIGH SCHOOL CHEMISTRY PROGRAM.

ACID-BASE CHEMISTRY
SCIENCE
SENIOR (COLLEGE)
PROGRAMS FOR LEARNING INC.
PROGRAMS FOR LEARNING INC.
$100.00
3.2
THIS PROGRAM CONTAINS MANY OF THE PRINCIPLES FOUND IN ACID/BASE CHEMISTRY AS WELL AS PROVIDE QUIZZES.

FUNDAMENTAL SKILLS FOR GENERAL CHEMISTRY
SCIENCE
SENIOR (COLLEGE)
PROGRAMS FOR LEARNING INC.
PROGRAMS FOR LEARNING INC.
$100.00
3.2
EMPHASIS IS ON THE MATHEMATICAL PRINCIPLES FOUND IN CHEMISTRY. THE COMPUTER ALSO CREATES QUIZZES FOR THE STUDENT.

ATOMIC STRUCTURE
SCIENCE
SENIOR (COLLEGE)
PROGRAMS FOR LEARNING INC.
PROGRAMS FOR LEARNING INC.
$100.00
3.2
THIS PROGRAM DEMONSTRATES A NUMBER OF PRINCIPLES AS WELL AS QUIZZES AND DEMONSTRATES THE OIL DROP EXPERIMENT.

CHEMICAL EQUILIBRIUM
SCIENCE
SENIOR (COLLEGE)
PROGRAMS FOR LEARNING INC.
PROGRAMS FOR LEARNING INC.
$100.00
3.2
CONTAINS:PH PROBLEMS,ESTIMATING EQUILIBRIUM,AMMONIA SYNTHESIS, VARIOUS PROBLEMS AND DRILLS,AND LECHATELIER'S PRINCIPLE.

PHYSICS I
SCIENCE
SENIOR (COLLEGE)
EDUCATIONAL COURSEWARE
QUEUE
$24.00
3.2 OR 3.3
THIS PROGRAM INCLUDES:ARROWS,THROW,RESTITUTION,STOPWATCH,LOGS AND MOMENTUM.

THE GAME OF LIFE
SCIENCE
JUNIOR/SENIOR
WISE OWL WORKSHOP
WISE OWL WORKSHOP
$10.00
3.2
THIS PROGRAM SIMULATES CELL GROWTH AS DESCRIBED IN THE SCIENTIFIC AMERICAN BY JOHN CONWAY.WILL STUDY SYSTEMS OF GROWTH.

VITAFACTS (DRINKING/DRUGS)
SCIENCE, COUNSELLING AIDS
JUNIOR/SENIOR
PERSONAL SOFTWARE INC.
PERSONAL SOFTWARE INC.
$19.95
3.2
THIS PROGRAM ASSISTS THE STUDENT IN MAKING DECISIONS REGARDING DRINKING AND DRUGS AND SUGGESTIONS FOR MAKING RESPONSIBLE DECISIONS.

VITAFACTS (SEX)
SCIENCE, COUNSELLING AIDS
JUNIOR/SENIOR
PERSONAL SOFTWARE INC.
PERSONAL SOFTWARE INC.
$19.95
3.2
THIS PROGRAM IS BASICALLY A PANEL DISCUSSION BETWEEN TWO OF CANADA'S FOREMOST SEX COUNSELLORS.

VITAFACTS (HEART ATTACKS)
SCIENCE, COUNSELLING AIDS
JUNIOR/SENIOR
PERSONAL SOFTWARE INC.
PERSONAL SOFTWARE INC.
$19.95
3.2
THIS COURSE ALLOWS THE USER TO BECOME FAMILIAR WITH MANY OF THE FACTS ABOUT HEART ATTACKS AND MANY OF THE PREVENTATIVE MEASURES THAT CAN BE TAKEN.

VITAFACTS (BLOOD PRESSURE)
SCIENCE, COUNSELLING AIDS
JUNIOR/SENIOR (COLLEGE)
PERSONAL SOFTWARE INC.
PERSONAL SOFTWARE INC.
$19.95
3.2
THIS PROGRAM DISCUSSES A NUMBER OF FACTS REGARDING HIGH BLOOD PRESSURE (HYPERTENSION) INCLUDING DEFINITIONS,CAUSES AND TREATMENTS.

VITAFACTS (GROWING UP)
SCIENCE, COUNSELLING AIDS
JUNIOR/SENIOR (COLLEGE)
PERSONAL SOFTWARE INC.
PERSONAL SOFTWARE INC.
$19.95
3.2
THIS PROGRARM DISCUSSES MANY OF THE FAACTORS ENCOUNTERED IN THE CHANGES OF ADOLESCENCE.STUDENTS LEARN ABOUT PHYSICAL AND AND EMOTIONAL CHANGES.

VITAFACTS (BIRTH CONTROL)
SCIENCE,COUNSELLING AIDS
JUNIOR/SENIOR (COLLEGE)
PERSONAL SOFTWARE INC.
PERSONAL SOFTWARE INC.
$19.95
3.2
THIS PROGRAM EXPLAINS THE PROCESS OF CONCEPTION AND THE BIRTH CONTROL METHODS AVAILABLE AND THE EFFECTIVENESS.

LINEAR KINEMATICS
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GENERATES FIVE QUESTIONS DEALING WITH LINEAR MOTION AND THE ANALYSIS OF A GRAPH OF INSTANTANEOUS SPEED VERSUS TIME.

PROJECTILE MOTION
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GENERATES A SERIES OF ELEVEN QUESTIONS DEALING WITH THE ANALYSIS OF A PROJECTILE IN FLIGHT.

MOMENTUM AND ENERGY
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
QUESTIONS DEALING WITH LINEAR MOMENTUM,IMPULSE AND KINETIC ENERGY.

ENERGY AND THE INCLINED PLANE
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE ANALYSIS OF THE MOTION OF A PARTICLE ON AN INCLINED PLANE.

INELASTIC COLLISIONS
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE ANALYSIS OF AN INELASTIC COLLISION.LINEAR MOTION AND KINETIC ENERGY ARE REVIEWED.

CENTRIPETAL FORCE
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE ANALYSIS OF A PARTICLE UNDERGOING UNIFORM CIRCULAR MOTION.

PULLEY SYSTEM-MACHINES
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
CONTAINS ANALYSIS OF SINGLE,DOUBLE,AND TRIPLE FIXED AND MOVEABLE BLOCKS.

CALORIMETRY
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
CONTAINS THE PRINCIPLES OF CALORIMETRY,HEAT CAPACITY,AND THE CONSERVATION OF ENERGY PRINCIPLE.

SPECIFIC HEAT CAPACITY
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE DEFINITION OF SPECIFIC HEAT CAPACITY.

HEATS OF FUSION/VAPORIZATION
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GENERATES QUESTIONS DEALING WITH THE CONCEPTS OF FUSION AND VAPORIZATION.

SPECIFIC GAS LAWS
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH GASES UNDERGOING ISOTHERMAL,ISOBARIC,AND ISOVOLUMIC PROCESSES.

GENERAL GAS LAW
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE BEHAVIOR OF A GAS UNDERGOING A GENERAL PROCESS IN WHICH ALL THREE THERMODYNAMIC VARIABLES MAY CHANGE.

THERMODYNAMICS I
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH A CONFINED GAS THAT UNDERGOES AN ISOBARIC PROCESS.

THERMODYNAMICS II
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH A CONFINED GAS WHICH UNDERGOES ISOBARIC COMPRESSION DURING WHICH A QUANTITY OF HEAT IS REMOVED.

TRANSVERSE STANDING WAVES
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE STANDING WAVE PATTERN ESTABLISHED IN OPEN AND CLOSED ORGAN PIPES.

LONGITUDINAL STANDING WAVES
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2

MIRRORS AND LENSES
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE IMAGE-FORMING PROPERTIES OF CONVEX AND CONCAVE MIRRORS AND LENSES.

REFRACTION OF LIGHT
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE BEHAVIOR OF LIGHT RAYS STRIKING A PLANAR INTERFACE BETWEEN TWO OPTICAL MEDIA.

FARADAY'S LAW
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE ANALYSIS OF AN ELECTROLYTIC SOLUTION.

GRAM-MOLECULAR MASS
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
RANDOMLY SYNTHESIZES ORGANIC COMPOUNDS WHOSE GRAM-MOLECULAR MASSES ARE TO BE DETERMINED.

THE MOLE CONCEPT
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE MOLES CONCEPT AND THE WRITING OF CHEMICAL FORMULAS.

THE MOLARITY CONCEPT
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE MOLARITY CONCEPT.THE MOLE CONCEPT IS REVIEWED.

THE NORMALITY CONCEPT
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE CONCEPTS OF GRAM-MOLECULAR MASS,GRAM EQUIVALENT MASS,AND NORMALITY.

THE MOLALITY CONCEPT
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE CONCEPTS OF GRAM-MOLECULAR MASS AND MOLARITY.

STOICHIOMETRY:MASS/MASS
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
PERMITS THE DEVELOPMENT OF FACILITY IN SOLVING PROBLEMS WHICH INVOLVE MASS-MASS RELATIONSHIPS IN VARIOUS CHEMICAL REACTIONS.

STOICHIOMETRY:MASS/VOLUME
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
PERMITS THE DEVELOPMENT OF FACILITY IN SOLVING PROBLEMS THAT INVOLVE MASS-VOLUME RELATIONSHIPS IN CHEMICAL REACTIONS.

STOICHIOMETRY:VOLUME/VOLUME
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
PERMITS THE DEVELOPMENT OF FACILITY IN SOLVING PROBLEMS WHICH INVOLVE VOLUME-VOLUME RELATIONSHIPS IN CHEMICAL REACTIONS.

STOICHIOMETRY:GENERAL
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GENERATES A SERIES OF QUESTIONS DEALING WITH STOICHIOMETRIC RELATIONSHIPS IN CHEMICAL REACTIONS.

PERCENT CONCENTRATION
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE COMPUTATION OF THE PERCENT OR FRACTION CONCENTRATION OF RANDOMLY GENERATED SOLUTIONS.

PH CONCEPT
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEEALS WITH THE CONCEPT OF PH AND POH.

EMF OF ELECTROCHEMICAL CELLS
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GENERATES A SERIES OF QUESTION IN WHICH THE STUDENT DETERMINES THE EMF OF A RANDOMLY SYNTHESIZED ELECTROCHEMICALC CELL.

ELECTRIC FIELD ANALYSIS
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE WORK DONE IN TRANSFERRING A CHARGED PARTICLE BETWEEN TWO POINTS IN A UNIFORM ELECTRICAL FIELD.

PHOTOELECTRIC EFFECT
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DEALS WITH THE ANALYSIS OF PHOTOELECTRIC EMISSION FROM THE SURFACES OF VARIOUS RANDOMLY SELECTED METALLIC CATHODES.

SYMBOLS AND VALENCES DRILLS
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
STUDENTS ARE GIVEN PRACTICE IN LEARNING THE SYMBOLS AND VALENCES OF THE COMMON IONS ENCOUNTERED IN ELEMENTARY COURSES.

NAMING COMPOUNDS DRILL
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
STUDENTS ARE GIVEN PRACTICE IN LEARNING TO NAME RANDOMLY SYNTHESIZED COMPOUNDS WHOSE FORMULAS ARE GIVEN.

FORMULAS OF COMPOUNDS DRILL
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
STUDENTS ARE GIVEN PRACTICE IN LEARNING TO WRITE THE FORMULAS OF RANDOMLY SYNTHESIZED COMPOUNDS.

TOTAL INTERNAL REFLECTION
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
GENERATES A SERIES OF QUESTIONS DEALING WITH THE REFLECTION OF LIGHT AT APPROPRIATE INTERFACES.

VECTOR ANALYSIS I
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
THE STUDENT IS ASKED TO DETERMINE THE MAGNITUDE AND DIRECTION OF THE RESULTANT OF A CONCURRENT SYSTEM OF THREE TO FIVE VECTORS.

VECTOR ANALYSIS II
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
THIS PROGRAM IS DESIGNED TO DETERMINE THE MAGNITUDE AND DIRECTION OF A SYSTEM OF CONCURRENT VECTORS.

GAS LAW ANALYSIS
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DESIGNED TO SOLVE A LARGE VARIETY OF PROBEMS IN WHICH GASES UNDERGO ISOTHERMAL,ISOBARIC,ISOVOLUMIC,AND GENERAL PROCESSES.

OPTICS ANALYSIS
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DESIGNED TO SOLVE A VARIETY OF PROBLEMS INVOLVING IMAGE FORMING PROPERTIES OF THIN LENSES AND CONVEX AND CONCAVE MIRRORS.

PROJECTILE ANALYSIS
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
THIS PROGRAM IS DESIGNED TO SOLVE THE GENERAL PROJECTILE MOTION PROBLEM.

CALORIMETRY ANALYSIS
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
THIS PROGRAM IS DESIGNED TO SOLVE THE VARIOUS PROBLEMS FOUND IN THE STUDY OF CALORIMETRY.

CHEMISTRY ANALYSIS I
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
PROVIDES SOLUTIONS TO PROBLEMS INVOLVING THE MOLE CONCEPT AND MOLARITY.

CHEMISTRY ANALYSIS II
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
PROVIDES SOLUTIONS TO PROBLEMS INVOLVING NORMALITY,MOLALITY, AND CHANGES IN FREEZING AND BOILING POINTS OF SOLUTIONS.

STOICHIOMETRIC ANALYSIS
SCIENCE
SENIOR (COLLEGE)
MICROPHYS PROGRAMS
MICROPHYS PROGRAMS
$20.00
3.2
DESIGNED TO PROVIDE SOLUTIONS TO PROBLEMS INVOLVING MASS-MASS, MASS-VOLUME,AND VOLUME-VOLUME RELATIONSHIPS IN CHEMICAL REACTIONS.

TELLSTAR
SCIENCE
ELEMENTARY JUNIOR/SENIOR (COLLEGE)
SCHARF SOFTWARE SERVICES
SCHARF SOFTWARE SERVICES
$79.95/39.95
3.2/ASB
THIS PROGRAM CONTAINS AN EXTREMELY WIDE VARIETY OF PROGRMS FOR ASTRONOMERS.IT USES HIGH RESOLUTION GRAPHICS TO LOCATE,IDENTIFY AND PROVIDE INFORMATION ON STELLAR OBJECTS.

MOLES AND FORMULAS
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.50
3.2/AS
CONTAINS:CONVERTING GRAMS TO MOLES,NUMBER OF MOLECULES TO MOLES,AVOGADRO'S RELATIONSHIP AND PERCENT COMPOSITION.

CHEMICAL EQUATIONS
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.50
3.2/AS
STUDENTS PRACTICE BALANCING EQUATIONS,MOLE RELATIONSHIPS IN EQUATIONS AND WEIGHT-WEIGHT PROBLEMS.

GAS RELATIONSHIPS
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.50
3.2/AS
CONTAINS:BOYLE'S LAW,CHARLE'S LAW,PARTIAL PRESSURE,VOLUME-VOLUME EQUATION RELATIONSHIPS,WEIGHT-VOLUME EQUATION PROBLEMS AND DENSITIES OF GASES.

SOLUTIONS
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.50
3.2/AS
STUDENTS PRACTICE AND LEARN NAMING,ION CONCENTRATION,MOLARITY, CALORIE PROBLEMS,AND THE FORMATION OF PRECIPITATES.

ELECTRON STRUCTURE
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.50
3.2/AS
CONTAINS:ORBITALS,VALENCE ELECTRONS,ELECTRON STRUCTURE,FILLING OF SUBLEVELS AND THE RELATIONSHIP OF VALENCE ELECTRONS TO THE PERIODIC TABLE.

BONDING IN MOLECULES
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.50
3.2/AS
STUDENTS PRACTICE ON:COVALENT BONDING,IONIC BONDING,BONDING PROPERTIES AND THE RELATIONSHIP TO THE PERIODIC TABLE.

BONDING BETWEEN MOLECULES
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.50
3.2/AS
THIS GIVES STUDENTS PRACTICE WITH CONCEPTS RELATED TO HYBRIDIZATION,SHAPES OF MOLECULES,VAN DER WAALS FORCES,AND NETWORK BONDS.

KINETICS
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.50
3.2/AS
STUDENTS PRACTICE PROBLEMS COVERING THE TOPICS OF REACTION RATES,COLLISION THEORY,HEAT OF REACTION,AND ACTIVATION ENERGY.

ACID/BASE PROBLEMS
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.50
3.2/AS
STUDENTS ARE ASKED QUESTIONS DEALING WITH PH,TITRATION PROBLEMS,DILUTION OF ACIDS AND THE NEUTRALIZATION OF SOLID BASES.

ELCTROCHEMICAL CELLS
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.50
3.2/AS
QUESTIONS PICK RANDOM VARIABLES FOR PROBLEMS ON ELECTROCHEMICAL CELLS,VOLTAGES,OXIDIZING AND REDUCING AGENTS IN CELLS ,AND THE DIRECTION OF BOTH ELECTRON FLOW AND ION FLOW.

OXIDATION/REDUCTION
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.50
3.2/AS
STUDENTS REVIEW OXIDATION NUMBERS,HALF REACTIONS,BALANCING OXIDATION/REDUCTION REACTIONS AND DETERMINING THE NUMBER OF ELECTRONS LOST AND GAINED.

CELLS
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.95
3.2/AS
STUDENTS ARE QUESTIONED AND GIVEN INFORMATION ON CELL THEORY, CELL STRUCTURES,SINGLE CELL ORGANISMS,AND THE DIFFERENCES BETWEEN ANIMAL AND PLANT CELLS.

TRANSPORT
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.95
3.2/AS
STUDENTS GET AN OPPORTUNITY TO REVIEW THE BLOOD SYSTEM,THE LYMPH SYSTEM,BLOOD CELLS,AND BLOOD TYPES.

ASEXUAL REPRODUCTION
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.95
3.2/AS
THE EMPHASIS IN THIS UNIT ON CELL DIVISION IS ON MITOSIS AND MEIOSIS.ALSO INCLUDED IS ASEXUAL REPRODUCTION IN SIMPLE ORGANISMS.

EXCRETION
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.95
3.2/AS
BESIDES REVIEWING THE NATURE OF METABOLIC WASTES,STUDENTS STUDY HOW WASTES ARE REMOVED IN SOME SIMPLE ORGANISMS AND HOW THE KIDNEYS FUNCTION IN HUMANS.

ENDOCRINE SYSTEM
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.95
3.2/AS
EMPHASIS IS ON THE HORMONES THAT ARE SELECTED BY THE ENDOCRINE GLANDS AND THE DUCTLESS SYSTEM.

BIOCHEMISTRY
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.95
3.2/AS
BIOCHEMISTRY STUDENTS REVIEW AND LEARN SOME BASIC ATOMIC STRUCTURE,BALANCING EQUATIONS,AND PROPERTIES OF PROTEINS AND CARBOHYDRATES.

DIGESTION
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.95
3.2/AS
STUDENTS ARE ASKED QUESTIONS DEALING WITH NUTRIENTS,DIGESTION IN SIMPLE ORGANISMS,AND THE DIGESTIVE PROCESS IN HUMANS.

LOCOMOTION
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.95
3.2/AS
STUDENTS REVIEW THE STRUCTURE AND FUNCTION OF BONES AND MUSCLES AS WELL AS THE TYPES OF MUSCLES AND JOINTS.

PHOTOSYNTHESIS AND TRANSPORT
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.95
3.2/AS
GIVES STUDENTS A BETTER UNDERSTANDING OF PHOTOSYNTHESIS,THE TRANSPORT SYSTEM OF PLANTS,AND THE FUNCTION OF VARIOUS KINDS OF PLANT CELLS.

REPRODUCTION PLANTS
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.95
3.2/AS
TOPICS COVERED INCLUDE ASEXUAL REPRODUCTION AND SEXUAL REPRODUCTION IN PLANTS.THERE IS A STRONG EMPHASIS ON THE PROCESSES THAT TAKE PLACE IN PLANTS.

RESPIRATION
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.95
3.2/AS
STUDENTS PRACTICE QUESTIONS COVERING THE PROCESS OF CELLULAR RESPIRATION,THE STRUCTURES THAT ARE INVOLVED,AND THE CHEMISTRY OF THE PROCESS.

GENETICS
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.95
3.2/AS
THIS PROGRAM CONTAINS THE RESULTS OF VARIOUS CROSSES OF PEAS, FOUR O'CLOCKS,AND FRUIT FLIES.THERE IS ALSO MATERIAL ON SEX LINKED DISEASES.

ANIMAL REPRODUCTION
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.95
3.2/AS
EMPHASIS IS ON THE DEVELOPMENT OF THE SPERM,EGG,AND THE FERTILIZED EGG.

CLASSIFICATION
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.95
3.2/AS
STUDENTS REVIEW THE ORGANIZATION OF LIVING THINGS.

NERVOUS SYSTEM
SCIENCE
SENIOR (COLLEGE)
J & S SOFTWARE
J & S SOFTWARE
$19.95
3.2/AS
STUDENTS STUDY THE NATURE OF A NERVOUS IMPULSE,NERVE IMPULSES IN SIMPLE ORGANISMS,REFLEXES,AND THE CHEMICALS INVOLVED IN THE TRANSFER OF NERVOUS IMPULSES.

SIMULATED COMPUTER
SCIENCE
JUNIOR/SENIOR
STEKETEE EDUCATIONAL SOFTWARE
STEKETEE EDUCATIONAL SOFTWARE
$17.95
3.2
THE STUDENT LEARNS THE BASICS OF COMPUTER PROGRAMMING WHILE BECOMING FAMILIAR WITH THE COMPUTER.

FLIGHT VECTOR
SCIENCE
SENIOR (COLLEGE)
STEKETEE EDUCATIONAL SOFTWARE
STEKETEE EDUCATIONAL SOFTWARE
$17.95
3.2
THIS PROGRAM TEACHES THE BASIC PRINCIPLES OF FLIGHT VECTORS TO STUDENTS.THE PROGRAM IS SET UP IN A GAME STYLE FORMAT.

CELL DIVISION/GENETICS
SCIENCE
JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

PLANTS/ECOLOGY
SCIENCE
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

DIGESTION/CIRCULATION
SCIENCE
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

RESPIRATION,EXCRETION,NERVOUS SYSTEMS
SCIENCE
JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

REPRODUCTION/MUSCLE AND BONES
SCIENCE
JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

NOVICE HAM RADIO LICENCE REVIEW
SCIENCE
JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

CHEMISTRY LAB SIMULATIONS #1
SCIENCE
SENIOR
HIGH TECHNOLOGY INC.
HIGH TECHNOLOGY INC.
$100.00
3.2
CONTAINS:ACID/BASE TITRATION,DETERMINATION OF A WEAK ACID EQUILIBRIUM CONSTANT,DETERMINATION OF AVOGADRO'S NUMBER.

CHEMISTRY LAB SIMULATIONS #2
SCIENCE
SENIOR
HIGH TECHNOLOGY INC.
HIGH TECHNOLOGY INC.
$100.00
3.2
THIS PROGRAM ILLUSTRATES THE IDEAL GAS LAW AS WELL AS AN EXTENSIVE UNIT ON ENTROPHY.

QUAL
SCIENCE
JUNIOR/SENIOR COLLEGE
MICROPI
MICROPI
$150.00
3.2
THIS IS A SIMULATION OF AN ORGANIC LABRATORY EXPERIMENT IN THE IDENTIFICATION OF IONS.

NOTAT
SCIENCE MATHEMATICS
JUNIOR/SENIOR COLLEGE
MICROPI
MICROPI
$75.00
3.2
THIS IS AN INTRODUCTION TO SCIENTIFIC NOTATION.

SCIENCE-VOLUME 3 (MIDDLE SCHOOL)
SCIENCE
JUNIOR
MECC SOFTWARE
MECC SOFTWARE(IN B.C. FROM JEM RESEARCH)
$15.00
3.2
THIS PROGRAM CONTAINS A WIDE VARIETY OF SCIENCE PROGRAMS RANGING FROM BIOLOGY TO GEOLOGY.

SCIENCE-VOLUME 2 (SENIOR HIGH)
SCIENCE
SENIOR
MECC SOFTWARE
MECC SOFTWARE(IN B.C. FROM JEM RESEARCH)
$15.00
3.2
THIS IS AN EXTENSIVE PROGRAM THAT DEALS WITH BIOLOGICAL,CHEMICAL,AND PHYSICS PRINCIPLES.

SOCIAL STUDIES-VOLUME 2 (SENIOR HIGH)
SOCIAL STUDIES
SENIOR
MECC SOFTWARE
MECC SOFTWARE(IN B.C. FROM JEM RESEARCH)
$15.00
3.2
THIS PROGRAM DEALS WITH A WIDE VARIETY OF SOCIAL STUDIES CONCEPTS FOR THE SENIOR HIGH STUDENT.

SAT TRAK
SCIENCE
JUNIOR/SENIOR COLLEGE
SAT TRAK INTERNATIONAL
SAT TRAK INTERNATIONAL

3.2
THIS PROGRAM ENABLES THE AMATEUR OR PROFESSIONAL TO EFFECTIVELY WORK WITH SATELLITE TRACKING EQUIPMENT.

SAMPLING
SCIENCE
SENIOR COLLEGE
COURSEWARE MAGAZINE
COURSEWARE MAGAZINE

3.2
THIS PROGRAM IS DESIGNED TO GIVE THE STUDENTS PRACTICE IN SAMPLING SMALL PARTS OF LARGE GROUPS AND DEVELOPING THEORIES BASED ON THE INFORMATION GATHERED.

EVOLUT
SCIENCE
JUNIOR/SENIOR COLLEGE
CONDUIT
CONDUIT
$35.00
3.2/IB
THIS IS A COMPUTER PROGRAM WHICH COVERS MANY ASPECTS OF MODERN EVOLUTIONARY THEORY.

ECOLOGICAL MODELING
SCIENCE
JUNIOR/SENIOR COLLEGE
CONDUIT
CONDUIT
$65.00
3.2/IB
THIS PROGRAM INTRODUCES STUDENTS TO THE TECHNIQUES FOR MODELING ECOLOGICAL SYSTEMS AND PROCESSES.

COEXIST
SCIENCE
JUNIOR/SENIOR COLLEGE
CONDUIT
CONDUIT
$35.00
3.2/IB
THIS PROGRAM PROVIDES STUDENTS WITH THE ABILITY TO STUDY POPULATION DYNAMICS BY SIMULATING BIOLOGICAL SITUATIONS.

LINKOVER
SCIENCE
SENIOR COLLEGE
CONDUIT
CONDUIT
$35.00
3.2/IB
THIS UNIT ALLOWS STUDENTS TO PLAN AND EXECUTE A PROGRAM OF EXPERIMENTS TO DRAW A GENETIC MAP OF A SINGLE CHROMOSOME.

ENZKIN
SCIENCE
SENIOR COLLEGE
CONDUIT
CONDUIT
$35.00
3.2/IB
THIS PROGRAM ALLOWS STUDENTS TO SIMULATE INSTANT RESULTS IN ENZYME-CATALYZED REACTIONS.

COMPETE
SCIENCE
JUNIOR/SENIOR COLLEGE
CONDUIT
CONDUIT
$35.00
3.2/IB
THIS UNIT CONTAINS SEVEN INVESTIGATIONS DESIGNED AROUND FLOWERING PLANTS.

RKINET
SCIENCE
SENIOR COLLEGE
CONDUIT
CONDUIT
$35.00
3.2/IB
IN THIS PROGRAM A MATHEMATICAL MODEL REPRESENTS A WAY IN WHICH VARIOUS FACTORS INFLUENCE THE RATE OF CHEMICAL REACTION.

HABER
SCIENCE
SENIOR COLLEGE
CONDUIT
CONDUIT
$35.00
3.2/IB
THIS COMPUTER SIMULATION ALLOWS THE STUDENT TO INVESTIGATE THE PROCESSES BEHIND THE HABER PRINCIPLES.

INTERP
SCIENCE
SENIOR COLLEGE
CONDUIT
CONDUIT
$35.00
3.2/IB
THIS PROGRAM IS DESIGNED TO GIVE THE STUDENT AN INTRODUCTION TO THE INTERPRETATION OF PHYSICS MODELS.

SCATTER
SCIENCE
SENIOR COLLEGE
CONDUIT
CONDUIT
$35.00
3.2/IB
THIS PROGRAM SIMULATES THE VARIOUS PHASES OF PARTICLE SCATTERING.

NEWTON
SCIENCE
JUNIOR/SENIOR COLLEGE
CONDUIT
CONDUIT
$35.00
3.2/IB
USING THIS PROGRAM STUDENTS ARE ABLE TO SIMULATE NEWTON'S EXPERIMENTS.

LABORATORY IN COGNITION AND PERCEPTION
SCIENCE
SENIOR COLLEGE
CONDUIT
CONDUIT
$110.00
3.2/IB
THIS PROGRAM INTRODUCES STUDENTS TO THE STUDY OF A VARIETY OF PHENOMENA,THEORETICAL POINTS OF VIEW,TECHNIQUES,AND EXPERIMENTAL DESIGNS.

GROUP VELOCITY
SCIENCE
SENIOR COLLEGE
CONDUIT
CONDUIT
$45.00
3.2/IB
IN THIS PROGRAM STUDENTS ARE TAUGHT HOW TO USE AND UNDERSTAND SINE WAVES AND TWO TYPES OF WAVE PROGRAMS.

TRIBBLES
SCIENCE
SENIOR COLLEGE
CONDUIT
CONDUIT
$35.00
3.2/IB
THIS IS AN INTRODUCTION TO SCIENTIFIC METHOD WHICH CONSISTS OF A WRITTEN TUTORIAL AND A COMPUTER SIMULATION.

PERCEPTION
SCIENCE
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$29.95
3.2/AS
THIS PROGRAM CONTAINS THREE SEPERATE PERCEPTION EXPERIMENTS.

STATISTICS
SCIENCE MATHEMATICS
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$24.95
3.2/AS
THIS PROGRAM DEALS WITH MANY OF THE COMMON STATISTICAL MEASURES AND PRINCIPLES.

METRI-VERT
SCIENCE
ELMENTARY JUNIOR/SENIOR

BELL & HOWELL
$24.95
3.2/AS
THIS IS A PROGRAM DESIGNED TO MAKE METRIC CONVERSION EASY.

CIRCULATION (ORGANS)
SCIENCE
ELEMENTARY JUNIOR/SENIOR COLLEGE

BELL & HOWELL
$37.50
3.2/AS
THIS PROGRAM INTRODUCES THE BLOOD CIRCULATION SYSTEM AND THE HUMAN ORGANS IN AN INTERESTING AND INFORMATIVE WAY.

CIRCULATION (SYSTEM)
SCIENCE
JUNIOR/SENIOR COLLEGE

BELL & HOWELL
$37.50
3.2/AS
THE PRACTICAL FUNCTIONS TOGETHER WITH THEIR CIRCULATORY INTERRELATIONSHIPS ARE COVERED IN THIS PROGRAM.

SIMPLE MACHINES
SCIENCE
ELEMENTARY JUNIOR/SENIOR

BELL & HOWELL
$37.50
3.2/AS
THE PRINCIPLES AND APPLICATIONS OF SIX SIMPLE MACHINES ARE PRESENTED AND DISCUSSED.

SCIENTIFIC METHOD
SCIENCE
ELEMENTARY JUNIOR/SENIOR COLLEGE

BELL & HOWELL
$24.95
3.2/AS
THIS PROGRAM ADDRESSES THE FOLLOWING TOPPICS:OBSERVATION, GENERALIZATION,MEASUREMENT AND VERIFICATION.

EVOLUT
SCIENCE
JUNIOR/SENIOR COLLEGE

BELL & HOWELL
$45.00
3.2/AS
THIS IS AN INTRODUCTORY UNIT TO EVOLUTION AND POPULATION GENETICS.

ECOLOGICAL MODELING
SCIENCE
JUNIOR/SENIOR COLLEGE

BELL & HOWELL
$67.50
3.2/AS
THIS PACKAGE CONTAINS TECHNIQUES FOR MODELING ECOLOGICAL SYSTEMS AND PROCESSES.

COEXIST
SCIENCE
JUNIOR/SENIOR COLLEGE

BELL & HOWELL
$45.00
3.2/AS
THIS PROGRAM SIMULATES TWO BIOLOGICAL SITUATIONS WHERE VARIABLES ARE MANIPULATED TO PROVIDE FOR OPTIMUM LIVING CONDITIONS.

USING COMPUTERS IN PHYSICS
SCIENCE
JUNIOR/SENIOR COLLEGE

BELL & HOWELL
$52.00
3.2/AS
THIS IS INTENDED TO ACT AS AN INTRODUCTION TO THE USE OF THE COMPUTER IN PHYSICS.

THREE MILE ISLAND
SCIENCE
JUNIOR/SENIOR COLLEGE
MICRO USERS SOFTWARE EXCHANGE
MICRO USERS SOFTWARE EXCHANGE
$39.95
3.2/
THIS IS A COMPLETE COMPUTER SIMULATION OF THE WORKINGS OF A NUCLEAR REACTOR.

ASTRONOMY I
SCIENCE
JUNIOR/SENIOR
RICHARD W. KING
RICHARD W. KING
$20.00
3.2/
THIS IS A STUDY OF MORE THAN 20 CONSTELLATIONS AND STARS SEEN IN THE NORTHERN HEMISPHERE.

PHYSICS I
SCIENCE
JUNIOR/SENIOR
RICHARD W. KING
RICHARD W. KING
$15.00
3.2/
THIS PROGRAM IS AN INTRODUCTION TO PHYSICS.

DR. DALEY'S BEST SOFTWARE
SCIENCE MATHEMATICS LANGUAGE ARTS
ELEMENTARY JUNIOR/SENIOR COLLEGE
DR. DALEY
DR. DALEY
$79.95
3.2/AS
THIS IS AN EXCELLENT VALUE CONTAINING OVER 50 PROGRAMS AT A COMBINED LIST OF OVER $400.00. THERE IS A LARGE VARIETY OF PROGRAMS WITH 50 PAGES OF DOCUMENTATION.

HUMAN FEMALE REPRODUCTIVE CYCLES
SCIENCE COUNSELLING AIDS
ELEMENTARY JUNIOR/SENIOR
COMPRESS
COMPRESS
$50.00
3.2/AS
CONTAINS:SELF-GENERATION,INDUCED OR ANNUAL,FERTILE,INFERTILE AND SUPPRESSED.

COLONIAL PERIOD/CONSTITUTIONAL PERIOD
SOCIAL STUDIES
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

CIVIL WAR PERIOD/INDUSTRIAL REVOLUTION
SOCIAL STUDIES
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

WORLD WAR I
SOCIAL STUDIES
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

WORLD WAR II
SOCIAL STUDIES
ELEMENTARY JUNIOR/SENIOR
TYC
TYC
$4.95
3.2
SUBJECT DATA TAPES FOR TYC INDIVIDUAL STUDY CENTER.

ELEMENTARY-VOLUME 3 (SOCIAL STUDIES)
SOCIAL STUDIES
ELEMENTARY
MECC SOFTWARE
MECC SOFTWARE(IN B.C. FROM JEM RESEARCH)
$15.00
3.2
THIS PROGRAM PROVIDES EXTENSIVE USE OF THE SKILLS USED IN ELEMENTARY SOCIAL STUDIES.

SOCIAL STUDIES-VOLUME 2 (SENIOR HIGH)
SOCIAL STUDIES
SENIOR
MECC SOFTWARE
MECC SOFTWARE(IN B.C. FROM JEM RESEARCH)
$15.00
3.2
THIS PROGRAM DEALS WITH A WIDE VARIETY OF SOCIAL STUDIES CONCEPTS FOR THE SENIOR HIGH STUDENT.

ELEMENTARY-VOLUME 6
SOCIAL STUDIES GEOGRAPHY
ELEMENTARY
MECC SOFTWARE
MECC SOFTWARE(IN B.C. FROM JEM RESEARCH)
$15.00
3.2
THIS PROGRAM SIMULATES A VARIETY OF HISTORICAL SITUATIONS AS WELL AS TEACHING MAP READING.

COOPERATIVE GAME #1
SOCIAL STUDIES
ELEMENTARY
EDUTEK
EDUTEK
$19.50
3.2/
THE STUDENTS MUST COOPERATE TO MOVE THE BLINKING CURSOR ACROSS THE SCREEN.

COOPERATION GAME #2
SOCIAL STUDIES
ELEMENTARY
EDUTEK
EDUTEK
$19.50
3.2/
THE STUDENTS MUST COOPERATE TO MOVE THE BLINKING CURSOR ACROSS A COMPLICATED SCREEN TO REACH A FLAG ON THE OTHER SIDE.

POPULATION
SOCIAL STUDIES
JUNIOR/SENIOR
RICHARD W. KING
RICHARD W. KING
$15.00
3.2/
THIS PROGRAM DISPLAYS THREE SEPARATE STUDIES OF POPULATION THAT ARE INTENDED TO GENERATE DISCUSSION.

FAMILY TREE TEACHER
SOCIAL STUDIES
ELEMENTARY JUNIOR
AUTOMATED TRAINING SYSTEMS
AUTOMATED TRAINING SYSTEMS

3.2/AS
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TEACHER
MECC SOFTWARE
MECC SOFTWARE(IN B.C. FROM JEM RESEARCH)
$15.00
3.2
A SAMPLING OF THE VARIOUS APPLICATIONS AVAILABLE ON MECC DISKETTES IS SHOWN.

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TEACHER AIDS
TEACHER
MECC SOFTWARE
MECC SOFTWARE(IN B.C. FROM JEM RESEARCH)
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3.2
THIS PROGRAM IS DESIGNED AS AN AID TO THE TEACHER AND IS A CONVENIENT LESSON PREPARING DEVICE.

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TEACHER AIDS
TEACHER
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COURSEWARE MAGAZINE

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THIS IS DESIGNED AS A TEACHER'S AID TO KEEP TRACK OF CLASS. GRADES IN ANY SUBJECT AREA.

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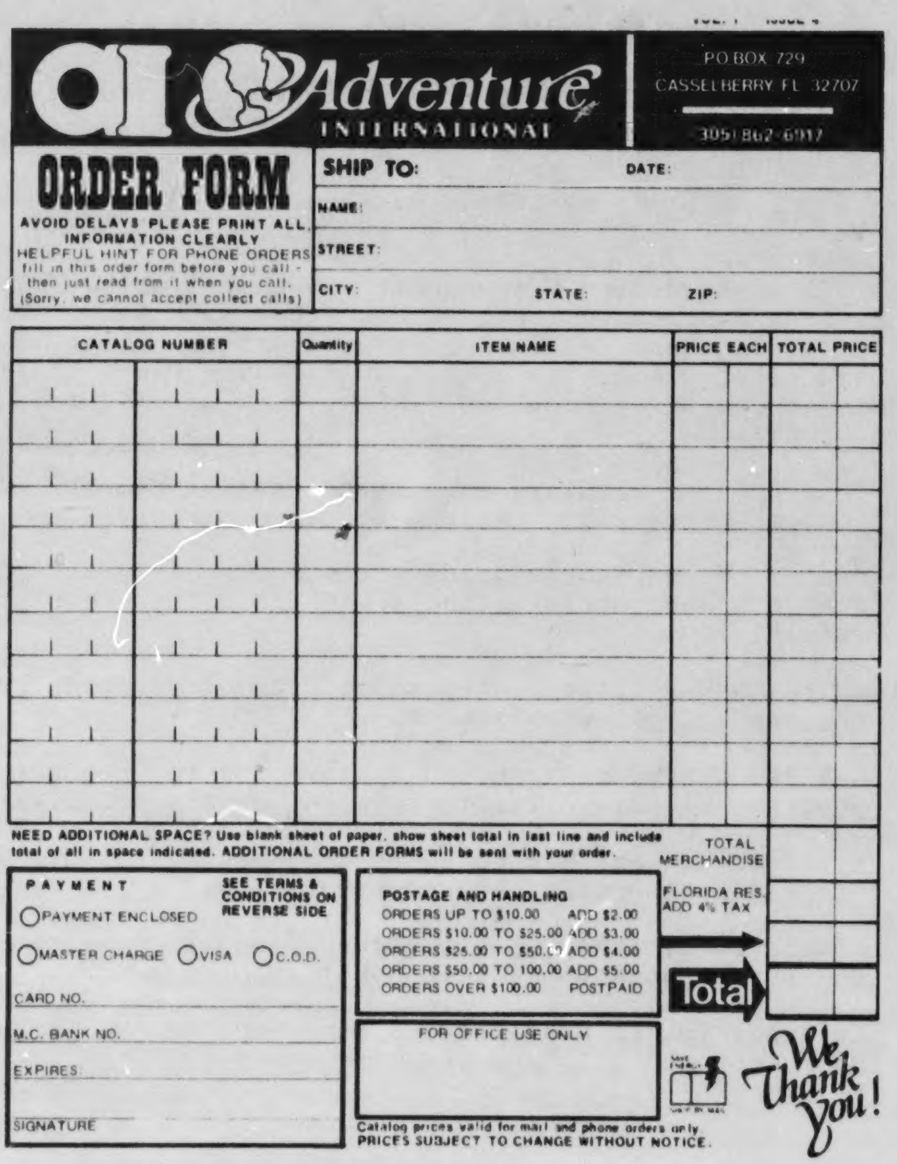

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Scoring and Management System for the Woodcock Reading Mastery Tests and the Apple II Computer

by Steven J. Schultz

This system is designed to handle all the figuring, plotting, table accessing and record keeping associated with this widely used diagnostic reading test. This fully integrated system of eleven programs and related files is linked by a menu. The user simply chooses an operation from the list by number to achieve these functions:

1. Computes and displays subject's grade placement, grade scores, percentile rank and relative mastery.
2. Graphs the subject's grade placement against the five subtests and total reading scores in a high-resolution format.
3. Stores and retrieves one-hundred student records for pretest and posttest scores.
4. Deletes a student's record by name for the pretest and posttest files. All file entries can also be cleared.
5. Averages subtest and total reading scores for all students in the pretest and posttest files.
6. Displays the names of all the students filed along with their pretest and posttest total reading scores.
7. If a printer is available, a hard copy can be produced by functions 1, 5, and 6.

This scoring and management system is one of the most sophisticated educational programs presently available for microcomputers. The size of the programs and files is an indication. When one-hundred student records are filed, this software consumes about one-hundred bytes of memory (100k). This software package requires an Apple II computer with 32k memory, single disk drive and Applesoft BASIC. If the disk version of Applesoft is used, 48k memory is needed.

American Guidance Service
Publishers' Building
Circle Pines, Minnesota 55014

The Shell Games

Apple's Shell Games turn your Apple Computer System into an excellent teaching aid for the home or classroom. The Shell Games diskette contains four programs. The first is an introductory color cartoon called "The Animated Apple"; the remaining three are The Match Machine, Mr. Multiple, and Professor True. They offer matching, multiple choice, and true/false quizzes, respectively, on a variety of subjects. Combined, these three programs contain over 180 ready-to-solve problems. And that's not all.

Because the Shell Games diskette also contains its own Editor, you can choose your own quiz problems to place into each "Shell". And you don't have to be a programmer in order to create highly successful quizzes. In a few short minutes, you can enter a complete quiz into any one of the three quiz programs; revisions can be made just as quickly.

The Shell Games interest, motivate and reward adults and children alike. Together, they offer the most exciting educational series available for use with a microcomputer!

Benefits

The Shell Games...

- *provide excellent teaching assistance to the educator by turning standard testing into exciting, challenging computer games...*
- *hold childrens' attention in the classroom by offering a variety of quiz and drill formats from which to choose...*
- *motivate children to perform well by rewarding correct responses with audio and video feedback...*
- *offer the parent a means of helping children with schoolwork at home, because quizzes and drills can be easily created for extra study in weak areas...*
- *provide interesting and amusing family entertainment through computerized trivia quizzes.*

The Shell Games—A Closer Look

Playing The Shell Games is fun and simple. Insert the program diskette into your disk drive. Then sit back and enjoy The Animated Apple, a brief, colorful cartoon that will lead you directly into the program selection chart menu.

Because The Shell Games were designed with children in mind, no complicated commands are necessary. Just select one of the three games and then follow the instructions on the screen. Correct responses to questions are rewarded, and scoring is performed automatically by each program.

Use the Shell Games Editor to enter new questions and answers into existing games, delete material you don't wish to use, or create entire quizzes on your own. You'll quickly build up large libraries of material that you can use over and over again.

System Configuration

To use The Shell Games program, you will need:

- Apple II or Apple II Plus (with Integer BASIC Firmware Card), each with 48K of memory; or
- Apple II with Apple Language System;
- Apple Disk II with controller;
- video monitor or television.

Technical Specifications

Language:
Written in Integer BASIC

The Shell Games Package
Order No. A2D0014

With your Shell Games order, you will receive:

- Shell Games diskette;
- Shell Games Instruction Manual.

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Apple PILOT

Apple PILOT is a powerful, easy to use system designed to support program development for Computer-Assisted-Instruction (CAI). If you're familiar with the PILOT language, you'll quickly become proficient in developing Apple PILOT courseware—and at a fraction of the cost of most other systems.

Based on COMMON PILOT (as defined by George Gerhold and Larry Kheriaty of Western Washington University), Apple PILOT offers much more than simple language capabilities. Color graphics, sound effects, and a character set editor allow lessons to be presented in words, pictures and sounds.

Benefits

Apple PILOT...

- *may be learned quickly by anyone familiar with the PILOT language, because it is menu-driven and provides HELP screens...*
- *significantly heightens students' interest and retention through its graphics, animation and sound effects capabilities...*
- *gives instructors access to large libraries of material, because programs written in PILOT 73 and COMMON PILOT may be run on the Apple system...*
- *allows educators to share material in creating new and different lessons, because libraries of pictures, sounds, character sets, and PILOT routines can be saved on diskettes...*
- *provides the capability of recording both student lessons and grades on the same diskette, because the author can programmatically create files for general purpose record keeping...*
- *places no restriction on lesson length, since a single lesson may span many files and/or diskettes...*
- *helps evaluate student performance by timing individual student responses...*
- *assists in foreign language instruction, because character sets in different languages can be developed easily...*
- *allows educators to make hardcopy files of lesson text through a built-in print routine.*

Apple PILOT— A Closer Look

Apple PILOT operates in two modes—Author and Lesson. In Author Mode, the instructor/designer creates lessons and stores them on a lesson diskette. The student then uses that diskette to "take a lesson", that is, interact with the computer as specified by the teacher.

In Author mode, menus and HELP screens direct and assist in creating a lesson. The main menu provides the following options.

Initialize a Diskette—Automatically formats a diskette and copies from the Author diskette certain required system programs and files.

Create/Edit PILOT Lesson Text—PILOT is a high level language particularly suited to the needs of courseware developers. It is the heart of the system. Using simple commands, the author defines the flow and logic of a lesson and integrates any previously defined graphics, sound effects, and special characters into that lesson. The lesson can also be tested by using the RUN option.

Create/Edit Graphics—The author can create high-resolution color graphics to include anywhere in the lesson(s). Simple keyboard commands draw lines, circles and rectangles; or the control paddles can be used to sketch free form designs. Text may be written anywhere on the graphic screen. These "pictures" are stored on diskette.

Create/Edit Sound Effects—Music/sounds can be dynamically created and played back using simple menus and keyboard commands The sounds are stored on diskette for inclusion in any lesson.

Create/Edit Character Sets—User defined characters are simply "drawn" on a grid using keyboard commands or control paddles. These special characters can be associated with any Apple keyboard printing characters.

Copy a Lesson Diskette—allows the author to make multiple copies of a lesson diskette for wide distribution or concurrent use by students.

In Lesson Mode, the student merely inserts a lesson diskette into a disk drive and is presented with the material as specified by the author/teacher.

System Configuration

To use Apple PILOT, you will need the following system:

- Apple II or Apple II Plus, each with 48K of memory;
- One Apple Disk II drive with controller for Lesson Mode; or two Disk II drives, one with controller, for both Author and Lesson Modes. No more than two drives are supported.
- DOS 3.3 or the Apple Language System, each with 16 sector state and boot PROMS;
- Video monitor or television.

Optionally, if lessons are to be printed, a compatible printer and printer controller card are required. The Apple Computer System works with several printers and appropriate controller cards, including those specified below:

- Apple Silentype Printer
  Card: Silentype Interface Card (supplied with printer)
- Centronics
  Card: Centronics Printer Interface Card (Apple Product A2B0007)
- Printronix
  Card: Parallel Interface Card (Apple Product A2B0002)
- Qume Sprint 5, Diablo Hyterm, and NEC Spinwriter 5510R
  Card: High Speed Serial Interface Card (Apple Product A2B0005) with P8-02 PROM

Technical Specifications

Language:
Written in Pascal; however the Apple Language System is not required to run Apple PILOT.

Diskettes: 16 sector format

Commands:
Apple PILOT includes all of the following standard COMMON PILOT commands:

A:	Accept	FO:	File Output	T:	Type
AS:	Accept Single	G:	Graphics	TH:	Type and Hang
C:	Compute	J:	Jump	U:	Use
D:	Dimension	M:	Match	XI:	Execute Indirect
E:	End	PR:	Problem		
FI:	File Input	R:	Remark		

In addition to providing all of the COMMON PILOT commands and facilities, Apple features the following extensions:

AP	Accepts point on graphics screen
FIX n,var$	Opens diskette file <var$> for input and/or output with <n> records
FOX n,var$	Creates new diskette file <var$> with <n> records
G C n	Sets pen color to <n>
G ES n	Erases the graphics screen color to <n>
G T	Prints text at the graphic cursor position
G V r.t.b	Sets graphic viewport coordinates
GX name	Draws previously defined graphic image <name> onto the screen
L name	
L name, label	Links to PILOT lesson <name>, optionally at the specified point <label>
PR.T nnn	Sets accept response time in seconds
S p,d	Generates a sound of pitch <p> for duration <d>
SX name	Plays previously defined sound effect <name>
TX name	Types output and accepts input using previously defined character set <name>
W nnn	Waits <nnn> seconds
X = BTN(n)	Returns push button status
X = KEY(0)	Returns keyboard status
X = PDL(n)	Returns control paddle position
X = RND(0)	Returns a random number between zero and one
X = TIM(0)	Reads accept response time

The Apple PILOT Package
Order No. A2D0028

With your Apple PILOT order, you will receive:

- Write-Protected copy of the Apple PILOT Author Diskette;
- Apple PILOT Lesson Diskette;

Apple Pascal

Apple Pascal is a fully professional system development environment. It incorporates the UCSD Pascal™ Operating System (Version 2.1), with enhancements for color graphics, sound generation, and Apple's special input/output features. Because it offers a compiled language, the Pascal system allows programs to execute more quickly and to take up less space than they would in BASIC. The structured programming facilities and extensive data structures in Pascal make it the language to choose for large business, scientific, and educational programs.

Benefits

Apple Pascal...

- *increases programmer productivity because it provides a total software development facility...*
- *simplifies program design through Pascal's convenient structural mechanisms and rich variety of data types...*
- *lowers development costs, as extended built-in error checking routines catch syntax, type and range errors...*
- *lowers maintenance costs because Pascal's modular structure minimizes convoluted code which is difficult to understand and modify...*
- *allows programs larger than available RAM to run, through the use of memory overlays...*
- *allows documentation, as well as program source code, to be written and modified through the utilization of a powerful, easy-to-use editor...*
- *supports Apple's special graphics and sound capabilities, plus control paddles, through system library routines...*
- *is the most transportable of all languages: it allows access to large libraries of Pascal programs and provides the capability to run your own programs on most Pascal systems...*
- *offers a performance increase of two to five times over equivalent BASIC programs.*

Apple Pascal— A Closer Look

Apple Pascal has been designed for the sophisticated programmer or computer science student. Its richness of data types, control functions, and powerful utility routines can dramatically improve a programmer's productivity on large projects. For this reason, Apple has selected Pascal as its standard system and applications development vehicle.

Why UCSD Pascal?

Since UCSD Pascal is recognized as the microcomputer industry standard, using it as a basis for Apple Pascal gives a programmer portability. Not only can a user access large libraries of Pascal programs already in existence, Apple Pascal programs can run with minimum conversion on most computer systems offering Pascal.

UCSD Pascal is more than a language: compiler, assembler, editor, linker, and file handler are integrated within a single, powerful system. This provides the user with a comprehensive set of software tools for optimal program development. Built-in procedures and functions enhance the string, byte, and I/O capabilities. Both 36-digit integers and 32-bit floating point are supported.

Technical Specifications

Diskettes:
16 sector format

Editor:
Editing functions include cursor control, text modification, formatting, searching and marking capabilities. The Editor offers:

- fast, screen-oriented editing for program development and text editing;
- 80-character lines (upper/lower case) available with external CRT terminal;
- 80-character lines supported in standard Apple using horizontal scrolling.

Editor Commands:

JUMP
PAGE
WRITE
FIND
INSERT
REPLACE
DELETE
XCHANGE
COPY
ZAP
VERIFY
QUIT
UPDATE
EXIT
RETURN
ADJUST
MARGIN
SET MARKER
SET ENVIRONMENT
AUTO-INDENT
FILLING
LEFT MARGIN
RIGHT MARGIN
PARAGRAPH MARGIN
COMMAND CHARACTER
TOKEN DEFAULT

Compiler:

- Pascal source text is translated into P-code.
- A group of one or more source language procedures or functions can be compiled separately as a UNIT, allowing a large program to be subdivided into smaller, more manageable parts. Commonly used procedures and functions can be compiled once, stored in a library file, and accessed by other programs through the Linker.
- EXTERNAL routines can be declared and are later linked into the host program by the Linker.
- Compiler option specifications can be embedded in the source text to control listings, screen messages, range-checking, inclusion of separate source files, and other compiler parameters.

Compiler Options:

C	Following characters are placed directly into codefile.
G+	Allows GOTO statements.
G−	Forbids GOTO statements.
I+	Generates I/O checking code.
I−	No I/O checking.
Ifilename	Includes named source file in compilation.
L+	Sends compiled listing to SYSTEM.LST.TEXT.
L−	Makes no compiled listing.
Lfilename	Sends compiled listing to named file.
P	Pages listing.
Q+	Suppress screen messages.
Q−	Sends procedure names and line numbers to CONSOLE:.

Assembler Directives

Delimiting Directive for Routines:

.PROC
.FUNC
.END

Label Definitions and Space Allocation Directives:

.ASCII
.BYTE
.BLOCK
.WORD
.EQU
.ORG
.ABSOLUTE
.INTERP

Macro Facility Directives:

.MACRO
.ENDM

Conditional Assembly Directives:

.IF
.ELSE
.ENDC

Pascal Host Communication Directives:

.CONST
.PUBLIC
.PRIVATE

External Reference Directives:

.DEF
.REF

Listing Control Directives:

.LIST
.MACROLIST
.NOLIST
.NOMACROLIST
.PATCHLIST
.NOPATCHLIST
.PAGE
.TITLE

File Directive:

.INCLUDE

Linker:

- Combines compiled P-code or assembled machine code files into the system work file or another specified code file. This eliminates the need to recompile or reassemble existing code files when incorporating them into a program.
- Designates any procedure or function at the P-code level as a SEGMENT, which means that its code can be swapped in and out of memory.
- Resolves references in compiled code to UNITS or EXTERNAL routines before program execution.

Filer:

- Handles the tasks of transferring information, i.e., storing and retrieving data on disk, moving and deleting disk files, creating and modifying diskette directories.
- Reports the location of files on diskette and what devices and diskettes are available.

System Library Contains:

- The "Turtlegraphics" code unit, which provides easy access to Apple's High Resolution color graphics routines. Functions and procedures permit the user to choose a color, move and turn the cursor, specify viewport boundaries, fill the viewport with color, copy an array of data to the screen from memory, write text on the graphics screen, and interrogate the system regarding the state of the cursor and screen. It adds the following procedures and functions: INITTURTLE, TEXTMODE, GRAFMODE, VIEWPORT, PENCOLOR, PENMODE, SCREENCOLOR, FILLSCREEN, MOVETO, TURNTO, TURN, MOVE, TURTLEX, TURTLEY, TURTLEANG, SCREENBIT, DRAWBLOCK, WCHAR, WSTRING, CHARTYPE.
- The "Apple Stuff" code unit, which contains routines to generate random numbers, interfaces with the control paddles, and generate sounds on the Apple's speaker. It adds the following procedures and functions: RANDOM, RANDOMIZE, PADDLE, BUTTON, TTLOUT, NOTE, KEYPRESS.
- The "Transcend" code unit, which contains transcendental functions useful for mathematical calculations. It adds the following procedures and functions: SIN, COS, ATAN, EXP, LN, LOG, SQRT.

Implementation Size Limits

The following is a list of maximum size limitations in the current implementation of UCSD Pascal:

- Maximum number of bytes of object code in a PROCEDURE or FUNCTION is 1200. Local variables in a PROCEDURE or FUNCTION can occupy a maximum of 16383 words of memory.
- Maximum number of characters in a STRING variable is 255.
- Maximum number of elements in a SET is 32 • 16 = 512.
- Maximum number of SEGMENT PROCEDUREs and SEGMENT FUNCTIONs is 16. (Six are reserved for the Pascal system, ten are available for use by the user program.)
- Maximum number of PROCEDUREs or FUNCTIONs within a segment is 127.

The Apple Pascal Package (Apple Language System) Order No. A2B0006

With your Apple Pascal order, you will receive the Apple Language System, which includes:

- Apple Language Card with 16K bytes of RAM;
- Six (6) diskettes, including Pascal System (4), Integer BASIC and Applesoft Extended BASIC (1), and one blank;
- IC puller;
- Three (3) Pascal manuals;
- Apple Language System Installation and Operating Manual;
- Apple II BASIC Programming Manual;
- Applesoft II Tutorial Manual;
- Applesoft II BASIC Programming Reference Manual;
- Two (2) 16 sector Disk Controller PROMS, P5A and P6A.

A

Why Apple Pascal?

Apple has taken advantage of all of UCSD Pascal's capabilities and can offer others as well. These include:

- easy access to Apple's human interface features: color graphics, speaker, control paddles, and keyboard;
- transcendental functions;
- faster disk response and transfer rates;
- extensive documentation.

System Configuration

To use the Apple Language System with Apple Pascal, you will need the following system:

- Apple II or Apple II Plus, each with 48K of memory;
- Apple Disk II with controller*; (a maximum of six drives are supported).
- Video monitor or television.

*While a single drive system is adequate for very small programs, two drives are strongly recommended for ease of operation and more serious program development.

Filer Commands:

GET
SAVE
NEW
WHAT
VOLUMES
LIST DIRECTORY
EXTENDED DIRECTORY LIST
REMOVE
TRANSFER
DATE
PREFIX
BAD BLOCKS
KRUNCH
MAKE
ZERO
QUIT
XAMINE
CHANGE

System Utilities Include:

- Desk calculator—performs simple calculations: addition,subtraction, multiplication, division.
- Disk formatter—prepares new disk for use with the Apple Pascal system.
- System librarian—links separately compiled or assembled routines into a library file.

R+	Generates range-checking code for array subscripts and variables.
R–	No range checking.
S+	Puts compiler in swapping mode.
S++	Compiler does even more swapping.
S–	Non-swapping mode: entire Compiler in memory.
U+	Compiles on user lex level.
U–	Compiles on system lex level.
Ufilename	Specifies name of library file for finding UNITs.

6502 Assembler:

- Permits relocatable assembly language routines to be generated for linking to Pascal programs.
- Supports parameterized macros.

The Controller

The Apple Controller is a comprehensive accounting system that enables the small business owner to manage his business more effectively. Not only does the system allow better planning of payments and faster cash collection, it also generates timely reports which allow the owner to act quickly, if necessary, on items affecting the financial health of the business.

Consisting of three modules—Accounts Receivable, Accounts Payable, and General Ledger—The Controller also offers an easy, effective alternative to manual bookkeeping. Complicated and repetitive accounting procedures are performed simply and automatically. The system provides rapid access to data, error-free computation and reporting procedures, and centralized record-keeping. The Controller is flexible as well: the Accounts Payable and Receivable systems may be used either independently or in conjunction with the General Ledger.

Discover the easier way to more effective cash and accounting management—consider the Apple Controller.

Benefits

The Apple Controller...

- *allows you to easily trace any transaction because it automatically prints audit trails...*
- *warns you of data entry errors and prompts you for further instructions through audio feedback ("beeps")...*
- *identifies and monitors slow paying customers through its account aging feature...*
- *assists you in planning cash needs for expenditures, and allows you to take advantage of discounts and "net" terms, because it tracks accounts payable by due date...*
- *shortens bookkeeping time required to maintain accurate records, because it automatically posts and updates...*
- *reduces bookkeeping errors by eliminating redundant writing, calculating and typing, and automatically printing management summaries, detailed reports, vendor and customer lists, mailing labels, account statements, and archival copies of each month's data for historical records...*
- *assists in maintaining complete, accurate and consistent records, because it encourages the use of standard bookkeeping practices...*
- *reduces the time required to process your accounts and makes information available to you when you need it through the power of your Apple Computer...*
- *protects you from losing important business information by automatically making a back-up copy of all operational data after posting.*

The Controller—A Closer Look

To assist you in determining if The Controller is appropriate for your accounting needs, this section describes each system module by its menu, including numeric and financial limits. If your business fits within these limits, The Controller is probably just the package for you.

The Accounts Receivable, Accounts Payable and General Ledger menus include three common options. The first of these is *Customizing Features,* a program which allows you to configure the system to your business needs, for example, whether finance charges should be calculated and at what percentage rate. The second is *Utilities,* a set of computer programs that enable you to make back-up copies of your diskettes; restore diskettes that have been damaged in some way; and determine how many entries you have made and the amount of diskette space remaining. *Change Today's Date* allows you to change the date each time you use the selected module.

Accounts Receivable (A/R) System Module
After selecting "Accounts Receivable" from the Controller's main menu, your screen will display the Accounts Receivable menu.

Customer Master allows you to establish and maintain an up-to-date listing of your customers. You may store data for up to 250 customers on each diskette (to a recommended maximum of three diskettes, or 750 customers).

Sales Entries enables you to enter your sales by batch (up to a maximum of 100 per batch at any one time), and print reports for proofing. Sales adjustments can also be entered at this time.

Payment Entries permits you to record payments made by your customers. Payments may be entered in batches (up to a maximum of 100 entries per batch at any one time). As with Sales Entries, adjustments can also be entered at this time.

As you post, both the Sales and Payment Entries are put into summarized forms, so that they may be later transferred automatically to the General Ledger should you choose to do so. One hundred Transfer Journal Entries may be made each month from the A/R program to the General Ledger.

Aged Trial Balance keeps track of outstanding balances, appropriately distributing them among four aging periods: current, 31–60 days, 61–90 days, and over 90 days. It also prints three different reports. The first is a Summary Report, showing customer information, account balance by aging periods, and the total amount due. The second, Detail Report, includes the same information as the Summary Report, as well as the balance forward for the month and current monthly transactions. The Monthly Activity Report details the business's total activity for the month by transaction, including sales, taxes and other amount categories. For audit purposes, the Detail Report must be printed before you can close the month.

Finance Charges is an optional feature which automatically computes, on a monthly basis, the finance charge percentages against your customers' balances. You are prevented from running Finance Charges more than once a month, and before you have posted Sales and Payment entries.

With the Accounts Receivable module, the total of finance charges, sales, or payment entries may not exceed 750 per diskette per month.

Statements generates computer-printed customer account statements. You may print up to 250 per month; the largest single balance for any one customer per aging period is $90,000.00.

Sales Commissions prints a report by salesman number detailing the amounts a business owes its commissioned salespeople, based on their individual sales for the month.

Close Month initiates the procedure that ends the monthly business cycle for billing. It eliminates all detailed transactions from Accounts Receivable and transfers the totals to the balance forward amount for the next month. Outstanding Accounts Receivable are aged automatically by one month.

Accounts Payable (A/P) System Module
After selecting "Accounts Payable" from the Controller's main menu, your screen will display the Accounts Payable menu.

Vendor Master allows you to create a master file of all vendors with whom you do business. The vendors may be temporary or permanent, and you may have up to 100 vendors at one time. You can add, change, examine and remove vendors from the master file, and print a Vendor Master report and vendor labels at any time.

New Invoices enables you to enter data for up to 300 invoices with distribution to twelve General Ledger accounts. The number of available invoice records is decreased for distributions more than three in number. For example, if an invoice is distributed to nine accounts, the computer will subtract three invoice records from the total available. Processing options for New Invoices include adding, changing, displaying, and removing entries. Each invoice will be

customized and the date you have specified must be identical within the system modules.

System Configuration

To use The Controller, you will need the Apple Business System, which includes:
- Apple II (with Applesoft Firmware Card and Autostart ROM) or Apple II Plus, each with 48K of memory;
- Two (2) Apple II Disk Drives, one with controller;
- Video monitor (preferred) or television set;
- Centronics Model 779 printer;
- Apple Centronics Printer Interface Card.

Technical Specifications

Recommended Limits:

General Ledger

Number of Accounts	250
Journal Entries Per Month	700
Standard Entries Per Month	50
Entries in One Batch	100
Different Journal Numbers	700
Amount of Any One Entry	$9.000.000 00
Amount of Any One Batch	$9.000.000 00
Balance in Any One Account	$90.000.000 00

Accounts Receivable

Customers per Data Diskette	250
Monthly Transactions per Diskette	750
Statements per Diskette	250
Account Transfers to G/L	100
Transactions per Batch	100
Number of Salespeople	99
Number of Diskettes	3
Customer Balance	$360.000 00
Any Customer Aging Period	$90.000 00
Any One Sale Amount	$90.000 00
Any One "Other" Amount	$9.000 00
Any One Tax Amount	$999 99
Amount of Any One Batch	$9.000.000 00

Accounts Payable

Number of Vendors	100
Number of Open Invoices	300
Checks Printed per Month	150
Invoices per Batch	100
Monthly Transfers to G/L	100
Distribution Accounts per Inovice	12
Amount of One Transaction	$999.999 99
Amount Owed per Vendor	$999.999 99
Amount of Any One Batch	$9.000.000 00
Discount Amount per Invoice	$9.999 99

Language:

Written in Applesoft BASIC.

Reports Generated by The Controller:

General Ledger:

Chart of Accounts (no Balances)
Chart of Accounts (with Balances)
Chart of Accounts Changes
General Journal Report
Standard Entries Journal
Trial Balance (Summary)
Detail Trial Balance
Balance Sheet (Summary)
Detail Balance Sheet
Income Statement (Summary)
Detail Income Statement*
Income Statement (Summary for Departments)
Detail Income Statement (for Departments)

Accounts Receivable:

Customer Master List
Customer Mailing Labels
Sales Journal (by Entry No.)
Sales Journal (by Document No.)
Payment Journal (by Entry No.)
Payment Journal (by Document No.)
Summary Aged Trial Balance*
Detail Aged Trial Balance
Monthly Activity Report
Statements and Summary
Sales Commission Report

Accounts Payable:

Vendor Master List (by Vendor Name or Number)
Vendor Mailing Labels
New A/P Invoice Register (by Voucher No.)
New A/P Invoice Register (by Vendor No.)
A/P Cash Requirements*
Open Invoices by Vendor
A/P Paid Invoice Register
Checks and Stubs
A/P Distribution Journal
A/P Disbursement Journal

*These are the key reports generated by The Controller. Samples of each are included in The Controller appendix, beginning on page 9.

The Controller Package
Order No. A2D0012

With your Controller order, you will receive:
- System Master Diskette and one (1) back-up;
- Two (2) General Ledger System diskettes and one (1) back-up for each;
- General Ledger Data Diskette and one (1) back-up;
- Two (2) Accounts Receivable System diskettes and one (1) back-up for each;
- Accounts Receivable Data diskette and one (1) back-up;
- Two (2) Accounts Payable System diskettes and one (1) back-up for each;
- Accounts Payable Data diskette and one (1) back-up;
- Four (4) blank diskettes;
- Apple Controller Instruction Manual;
- 36 extra data diskette labels;
- Software License form, including an 800# for toll-free hotline support;
- Three-ring binder;
- Business forms kit sample and order forms;
- Diskette holders.

Apple Writer

The Apple Writer program turns your Apple Computer System into a sophisticated text editor—providing you with the capability to write, revise, edit, and print all types of documents quickly and inexpensively. You can easily perform every editing task, from correcting typographical errors to moving whole paragraphs. And you can precisely format and print your text letter-perfect every time.

Benefits

Apple Writer…

- ***saves time often spent modifying, moving, and formatting text, with its extensive editing and printing commands…***
- ***increases productivity by eliminating retyping because corrections can be made character-by-character, so there's no need to retype an entire line when only minor changes are required…***
- ***is easy to learn and operate with its simplified command structure…***
- ***saves paper costs and filing space with floppy diskette storage…***
- ***reduces paperwork costs with its powerful editing capabilities…***
- ***allows you to write in any order you choose, so text can be stored in sections and later combined in any order for printing…***
- ***protects files from accidental loss through its program/system recovery and audible prompt features.***

Apple Writer— A Closer Look

The Apple Writer program diskette contains a Tutorial text file which you can view on your screen. It introduces you to some of the features of the Apple Writer editor, so that you'll feel more comfortable using the program for the first time. Just follow the simple instructions in the Apple Writer program manual to access the Tutorial.

The Apple Writer program is ready to use when the "Editor Menu" is displayed on your monitor or television screen.

By selecting INITIALIZE NEW FILE, for example, and pressing the "return" key, you may begin a new document. Simply enter your text on the Apple's keyboard, and it will be displayed simultaneously on your screen. Although only upper case letters will appear, Apple Writer will automatically translate them into lower case during printing. To capitalize a letter or word, use the "ESC" key; capitals will appear as inverse video on your screen and upper case when printed.

With Apple Writer, pressing the "return" key is necessary only at the end of paragraphs. Apple Writer will automatically insert all other "returns" during printing. You can type continuously—and faster—since there's no need to strike the "return" key at the end of every line.

If you want to add a new word or sentence in the middle of a paragraph, move the cursor to the location and begin typing. To remove a word or sentence, simply delete the undesired text by positioning the cursor after the data and backspacing.

Apple Writer also provides a powerful automatic or manual "search and replace" feature. If you've misspelled a word throughout the text, for example, enter the misspelled word and its correct spelling. Then type two simple commands, and Apple Writer will change every misspelling of the word instantly. If you've overused a word and wish to change it only in specific locations, enter the word and an appropriate synonym. Apple Writer will lead you through the text, stopping at each occurrence of the word. You can then specify where you wish each substitution to be made.

To format text, just type one of the four commands that center, left-, right-, or fill-justify lines during printing.

With your Apple Computer System connected to a compatible printer, Apple Writer will print your finished documents automatically.

The Apple Writer "Print Menu" will be displayed after you have selected PRINT FILE from your Editor Menu.

To print your document, select PRINT NEW DOCUMENT and press the "Return" key. Apple Writer will then display a listing of printer parameters.

Specify desired line spacing, number of lines per page, page numbering, and margins. Then press the "return" key once more. Apple Writer will print your document exactly as you've specified.

With Apple Writer, a first draft can be the final copy—every time.

System Configuration

To use the Apple Writer program, you will need the following system:

- Apple II or Apple II Plus, each with 48K of memory;
- Apple Disk II with controller;
- a video monitor or television;
- a compatible printer*;
- a printer controller card*.

*Note The Apple Computer System works with several printers and appropriate controller cards, including those specified below

- Apple Silentype Printer
  Card Silentype Interface Card (supplied with printer)
- Centronics 779
  Card Centronics Printer Interface Card (Apple Product A2B0007 included if printer is purchased from Apple Computer Co.)
- Printronix
  Card Parallel Interface Card (Apple Product A2B0002)
- Qume Sprint 5 Diablo Hyterm and NEC Spinwriter 5510R
  Card High Speed Serial Interface Card (Apple Product A2B0005) with P8-02 PROM

The Apple Writer Package
Order No. A2D0026

With your Apple Writer order, you will receive:

- Two (2) Write-Protected Apple Writer Diskettes
- Two (2) Non-Write Protected Apple Writer Diskettes
- Apple Writer Instruction Manual

Apple Plot

The Apple Plot program allows you to use your Apple Computer System to create, revise, and print highly detailed charts and graphs quickly and easily. Any information, from sales and stock activities to caloric intake and miles per gallon, can be presented in a visually appealing, comprehensive bar, line or scatter chart.

The program allows you to specify each axis, update and change information, and label the charts exactly as you wish. If your monitor or television is color, graphs can be colored for differentiation and effect. With the Apple Graphics Tablet, you can further customize any graph with a company logo or other marking. Transparencies of finished graphs can be used for presentations; hard copy can be printed for reports and later analysis.

Benefits

Apple Plot...

- *helps you understand numerical information by displaying it graphically...*
- *offers the capability for displaying externally generated data, because it can be used with other data base programs...*
- *saves countless hours of design and drawing time by producing a finished chart automatically—you need only provide data points and choose the format...*
- *offers versatility in presenting material, because it provides six graph forms from which to choose...*
- *allows data to be differentiated on the screen through your Apple's color capability...*
- *permits design of custom plots because the user controls every graph parameter...*
- *provides for comparisons because two graphs can be displayed on the same axis, and each graph can contain up to 100 points.*

Apple Plot— A Closer Look

It's easy to put Apple Plot to work. The program diskette contains sample data sets to help you learn to create custom plots. Following the step-by-step instructions in the Apple Plot manual, you can "chart" your way, selecting functions from the program's main menu.

Graph Format Selection—This Apple Plot option offers a choice of six graph formats for plotting up to two separate data sets in a single display. If you're plotting more than two, there is a special overlay capability which allows additional data sets to be placed on the same graph. You can also physically exchange the coordinate data of the two data sets automatically, as well as specify colors.

X-Axis and Y-Axis Parameters—These options let you specify the limits, resolution and labeling of the axes. Apple Plot will ask questions about the data (for example, Is This a Monthly Plot?), display a possible reply (called a "default" reply), and wait for you to either confirm its answer or type in a different one.

Data Entry and Editing—This option is used for entering the number of data points in a graph; specifying where they are to be placed; changing information if necessary; or displaying a list of the data points in the current data set.

Display Graph—This option actually produces the graph on the screen.

Save Data to Disk—There are two forms in which you can save Apple Plot data onto an Apple diskette: Data and Picture. Data saves the data points in both data sets, the selected graph format, and all of the X- and Y-axis parameters. Picture saves the Apple's high-resolution screen image of the most recently displayed graph (especially useful when other graphs have been overlayed).

Recall Data from Disk—Although there are only two ways to store Apple Plot data onto a diskette, there are three in which to recall it: Data, Data (Raw) and Picture. When you recall Data, Apple Plot will display all stored data; when you recall Data (Raw), it will provide only the data points (used for reading data generated by external programs.) Picture recall simply redraws a previously developed high resolution screen image, exactly as it looked when it was saved.

Clear for New Graph—Resets all parameters and data to begin a new graph.

Print the Graph—Provides hard copy printout of graphs when an Apple Silentype or Qume Sprint 5 is connected to your system.

Additionally, there's a special program on the Apple Plot diskette that allows you to use your stored charts and graphs in a "slide show" on your monitor or television screen. This unique capability is ideal both for reviewing different graphs and for making presentations without the need for hardcopy or other printed visuals.

System Configuration

To use Apple Plot, you will need:

- Apple II (with Applesoft Firmware Card), or Apple II Plus, each with 48K of memory; or
- Apple II with Apple Language System;
- One Apple Disk II drive with controller (second drive optional);
- a video monitor or television;
- a compatible printer* (optional);
- a printer controller card* (optional).

*Note: An Apple Computer System using Apple Plot works with the following printers and appropriate controller cards:

- Apple Silentype Printer

Card: Silentype Interface Card (supplied with printer)

- Qume Sprint 5

Card: High Speed Serial Interface Card (Apple Product A2B0005) with P8-02 PROM

Technical Specifications

Language: Written in Applesoft BASIC.

Program Status Codes:

Ranging Data—displayed when data has been read in the Raw format.

Check Your Input—displayed, accompanied by three "beeps", whenever Apple Plot encounters an error or inconsistency of any kind when trying to recall data from the diskette.

Clearing—displayed when Apple Plot is resetting all parameters to their original default values.

Default Values:

Graph Format Selection: Standard Graph with Graph Overlay
Overlay Additional Graphs: OFF
Color for Plot 1: White
Color for Plot 2: Blue

X-Axis Parameters:

Monthly Plot: N
First Month: 1
  Number of months: 12
Yearly Plot: N
  Number of first year: '80
  Number of last year: '90

Number of Divisions: 10
Maximum X-Axis Value: 1
Minimum X-Axis Value: 0
X-Axis Label: X
Use Label #1: N
  Change Label #1: N
  Text for Label #1: (blank)

Use Label #2: N
  Change Label #2: N
  Text for Label #2: (blank)
Extended Vertical Grid Lines: N

Y-Axis Parameters:

Number of Divisions: 10
Maximum Y-Value: 1
Minimum Y-Value: 0

Y-Axis Label: Y
Title of Graph: Unformatted Graph
Extended Horizontal Grid Lines: N

Data Entry and Editing:

Number of data points
  Starting point for plot 1: 0
  Ending point for plot 1: 0
  Starting point for plot 2: 0
  Ending point for plot 2: 0

Data Entry
  All data points, X-value: 0
  All data points, Y-value: 0

Display Graph:

Location of label 1
(before positioning): upper left-hand corner
Location of label 2
(before positioning): upper left-hand corner

The Apple Plot Package Order No. A2D0033

With your Apple Plot order, you will receive:

- Two (2) Write-Protected Apple Plot diskette;
- Two (2) Non-Write Protected Apple Plot diskette;
- Apple Plot Instruction Manual

Apple FORTRAN

FORTRAN is a powerful programming language, especially suitable for work in mathematics, engineering and the sciences. Apple FORTRAN, usable with the Apple Language System, is the ANSI Standard Subset of the recently-defined FORTRAN 77 standard; in several areas, Apple FORTRAN contains enhanced features and capabilities.

Apple is providing FORTRAN for use by technical professionals and educators who are both familiar with the FORTRAN language and are using packages written in FORTRAN. Because FORTRAN is a well-established language, large libraries of FORTRAN programs are already in existence, particularly for engineering and scientific applications. Apple FORTRAN provides the sophisticated FORTRAN user with the capability to develop new and modify existing FORTRAN programs on an Apple. Apple does not recommend FORTRAN for the individual new to programming.

Benefits

Apple FORTRAN...

- *offers enhanced features and capabilities because it supports the newest computer industry standard, ANSI X3.9-1978...*
- *provides a comprehensive software design environment including an editor, linker, file handler, assembler, Apple Pascal compiler, and system library, operating in the Apple Language System...*
- *eliminates the need to recompile or reassemble existing code files when incorporating them into FORTRAN programs; compiled P-code and assembled machine code can be combined with a FORTRAN P-code file through the Apple Language System's linker facilities...*
- *allows you to take full advantage of Apple's Hires graphics capabilities by interfacing to graphics routines in the system library...*
- *gives programmers access to large libraries of material, since FORTRAN is a familiar, well-established language...*
- *provides access to special Apple features,such as sound generation and control paddles,through its system library routines...*
- *permits you to combine several source files in a single compilation through compiler directives in the source code.*

Apple FORTRAN—A Closer Look

First, Some Words About FORTRAN '77

FORTRAN 77 contains significant additions and enhancements to the previous 1966 standard. For example, mixed-mode arithmetic expressions are allowed. Structured programming is supported through expanded IF statement constructs. Logical IF, Block IF, ELSE IF, ELSE, and END IF statements provide a vastly improved method of clearly and accurately specifying the flow of program control. CHARACTER data type replaces Hollerith; alphanumeric data can be represented as strings rather than array elements.

Some Specifics About Apple FORTRAN

Apple FORTRAN is the ANSI Standard Subset FORTRAN 77. It also supports enhancements and facilities from the full FORTRAN 77 language. In particular:

- Subscript expressions may include array elements and function calls.
- DO statement limits may be defined by expressions, rather than just single variables.
- I/O units may be specified by expressions, rather than just constants or simple variables.
- The I/O list of a WRITE statement may include expressions.

- All combinations of FORMATTED/UNFORMATTED and SEQUENTIAL/DIRECT files are allowed, with the following restrictions:
—BACKSPACE is supported only for files connected to the blocked devices; it is not supported for UNFORMATTED SEQUENTIAL files;
—DIRECT files must be connected to block devices.

Apple FORTRAN contains a number of enhancements beyond the full FORTRAN 77 specifications. In particular:

- Compiler directives may be included in the source code. For instance, the $INCLUDE directive allows you to insert previously-developed code into your program without having to repeat the code. This is useful, for example, when you are writing many subroutines which use the same COMMON block. You can write the COMMON block just once, and $INCLUDE it in every subroutine.
- An additional parameter to the OPEN statement allows you to specify whether the file is blocked or unblocked.

There are two minor differences between the ANSI Standard Subset FORTRAN 77 and Apple FORTRAN. They are:

- Subprogram names cannot be passed as parameters.
- INTEGER and REAL data types have different storage requirements—two bytes for INTEGER, four bytes for REAL.

System Configuration

To use Apple FORTRAN, you will need:

- Apple II or Apple II Plus, each with the Apple Language System;
- Apple Disk II drive with controller*;
- video monitor or television.

*While a single drive system is adequate for very small programs, two drives are strongly recommended for ease of operation and more serious program development.

Technical Specifications

Apple FORTRAN is written in Pascal and produces P-code which runs in the Apple Pascal Operating System.

Diskettes: 16 sector format

The standard library of intrinsic functions supplied with Apple FORTRAN include:

INT IFIX REAL FLOAT ICHAR
AINT ANINT NINT IABS ABS
MOD AMOD ISIGN SIGN IDIM
DIM MAXO AMAXO MAXI AMAXI
MINO AMINO MINI AMINI SQRT
EXP ALOG ALOGIO SIN COS
TAN ASIN ACOS ATAN ATAN2
SINH COSH TANH LGE LGT
LLE LLT CHAR EOF

The Apple FORTRAN Package Order No. A2D0032

With your Apple FORTRAN order, you will receive:

- One (1) each copy of the two FORTRAN system diskettes;
- Apple FORTRAN Language Reference Manual.

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Applesoft and Integer BASIC

When you purchase an Apple II or Apple II Plus computer, you buy more than hardware—you receive a built-in programming system as well. This "firmware" makes it easy to create interesting and useful programs, even if you've never programmed before. In the Apple II computer, the resident firmware is Integer BASIC; in the Apple II Plus, it is Applesoft Extended Floating Point BASIC, or Applesoft for short. Both Integer BASIC and Applasoft are versions of the very popular BASIC programming language.

Both Integer BASIC and Applesoft come with easy-to-follow tutorial manuals that start you doing useful work with your Apple right away.

Benefits

Integer BASIC and Applesoft…

- *eliminate the need for writing programs to express problems, through their simplified command structures…*
- *allow you to take advantage of large libraries of existing programs because both are very popular languages…*
- *permit critical portions (e.g., graphics animation) of programs to be run at high speed, because both allow direct access to assembly language subprograms…*
- *turn your Apple into a desktop calculator because both automatically perform arithmetic computations (add, subtract, multiply, divide, raise to a power)…*
- *allow you to modify and store data for repeated use, because both accept input/output operations from the keyboard, video monitor or television, disk drive, and other peripheral devices…*
- *provide you with greater flexibility in conveying information, because both will create color dots and horizontal and vertical lines on the screen…*
- *allow you to quickly and easily change or correct any part of a program because both accept editing commands…*
- *save you time in locating programming errors, because both give immediate feedback if an error exists and provide its location.*

Applesoft and Integer BASIC—A Closer Look

Applesoft II Floating Point BASIC language, resident in Apple II Plus computers, is an expanded version of Microsoft's popular floating point BASIC. It is a fast, convenient, general purpose language. Applesoft's 9-digit arithmetic and large function library make it ideal for the majority of BASIC programming applications. Features like high resolution graphics routines and user-programmable error messages make the language both powerful and friendly.

Integer BASIC, resident in Apple II computers, is a subset of standard BASIC. It is well suited to writing games, because its high performance makes realistic animation possible. It is not generally suitable for business or scientific applications since it works only with integers (whole numbers).

A Special Note to Non-Programmers

Have you ever purchased a product advertised as "so simple to use even a child can do it", only to discover that it was neither simple nor child's play? This is not the case with Applesoft or Integer BASIC. All you need to use either language is an interest in programming. Apple's comprehensive tutorial manuals will provide the rest. As you progress, you'll learn to speak a BASIC language to your Apple, create new applications, and become familiar with programming terminology. Before you know it, you'll be writing programs for your Apple.

For Those Already Familiar with Programming

There is one fundamental difference between Applesoft and Integer BASIC. Integer BASIC deals only with integer values in the range ± 32,767. Applesoft, in addition to dealing with those same integer values, is also capable of manipulating floating point (real) quantities. Its range is approximately ± 10 to the 38th power, with 9-digit precision. Additionally, Applesoft offers built-in trigonometric, transcendental, and other mathematical functions ideal for financial and scientific calculations. Applesoft can also handle multi-dimensional arrays (up to 88 dimensions, both numeric and string), while Integer BASIC recognizes only single-dimension arrays.

System Configuration

If you own an Apple II, Integer BASIC is resident within the system. To run Applesoft BASIC on your Apple II, you will need either:

- an Applesoft Firmware Card, or
- the Apple Language System.

If you own an Apple II Plus, Applesoft BASIC is resident within the system. To run Integer BASIC on your Apple II Plus, you will need:

- an Integer BASIC Firmware Card, or
- the Apple Language System.

Technical Specifications

Applesoft BASIC

Applesoft BASIC capabilities include:

- Three data types -- Real, Integer and String
- N-Dimensional Arrays and N-Letter Variable Names (first two letters significant)
- Extensive Mathematical, Logical and Scientific Capabilities
  EXP, LN, SQ RT, SIN, COS, TAN, ARCTAN, AND, OR, NOT, ABS, INT, RND, SIGN
- String Operations to Aid the Business Programmer
  Compare >, <, > =, < =, < >
  Concatenate +
  Variable Type Conversion ASC, STR, VAL
  Substring Functions LEFT, RIGHT, MID, LEN
- Graphics Statements that Simplify Display Programming
  Print Control NORMAL, INVERSE, FLASH
  Graphics Control COLOR, PLOT, POSN, HLIN, VLIN, SCRN, GRAPHICS, TEXT, HGR, ROT, SCALE, SHLOAD
- General Operations that Include and Extend Upon Dartmouth BASIC:
  Program Manipulation CLEAR, NEW, LIST, RUN, CONT, LOAD, SAVE
  Variable and Function Definition DATA, DEF, DIM
  Data Handling and Storage READ, RESTORE, STORE, RECALL
  Loops and Branching FOR NEXT, IF GOTO, IF THEN, ON GOTO, ON GOSUB, ONERRGOTO, RESUME, GOTO, GOSUB, RETURN
  Input/Output and Format Control INPUT, GET, PRINT IN#, PR#, VTAB, TAB, HOME
  Machine Level Statements PEEK, POKE, CALL, POP, LOMEN, HIMEN

Integer BASIC

In addition to normal BASIC capabilities, Apple Integer BASIC includes:

- Any-length variable names (ALPHA, BETA$) (all characters significant)
- Syntax and range errors indicated immediately when entered
- Multiple statements on one line
- Integers from − 32767 to + 32767
- Strings to 255 characters, single-dimension integer arrays
- Graphics Commands
- Paddle read function
- TEXT and Graphics Commands to set display mode from BASIC
- Immediate execution of most statements
- Break and Continue program execution
- Debug commands line number trace and variable trace
- Switchable I/O device assignments
- PEEK, POKE, CALL, POP commands
- Auto line number mode
- RND, SGN, ASC, LEN and ABS functions
- GOTO expr, GOSUB expr allowed

DOS 3.3

DOS 3.3 is the handy housekeeper developed by Apple to help you take full advantage of your Disk II Floppy Disk Subsystem. DOS automatically keeps track of files, saves and retrieves information on a diskette, and performs a variety of other "housekeeping" chores. It dynamically allocates diskette space in a manner that's totally transparent to you, yet maximizes diskette capacity. DOS stands for Disk Operating System; 3.3 is the version update number. When you purchase an Apple Disk II with controller, you are buying an Apple floppy disk drive and DOS 3.3.

Benefits

DOS 3.3...

- *simplifies system start up by allowing for turnkey operation under Apple BASIC...*
- *increases disk capacity by more than 20% over previous versions of DOS...*
- *increases a system's capability by storing and retrieving information much more accurately, quickly, and conveniently than is possible with cassette tape...*
- *adds to system efficiency by allowing you to access data by the name under which it is filed...*
- *saves time spent searching for files because it automatically catalogs them by name and displays the complete catalog upon command...*
- *provides the capability to save, load, run, rename, delete, and verify files quickly and easily through its variety of housekeeping commands...*
- *allows rapid data retrieval through both sequential and random access to the data...*
- *encourages good programming practices by allowing you to make back-up copies of diskettes on a single disk drive system, rather than requiring two drives for the same purpose.*

DOS 3.3—A Closer Look

If you've purchased an Apple Disk II with DOS 3.3, only a few keystrokes are required to put the program to work for you. This process is called "booting" the disk and is explained in detail in the DOS manual.

If you are using a previous version of DOS and want to update your system to run DOS 3.3, you'll need the DOS 3.3 Kit to boost your disk capacity to accommodate the new version. The kit contains two PROMs which you will need to install. (If you are using the Apple Language System, you've already installed them).

The System Master diskette that comes with the DOS manual is a very special one: it allows you to copy an entire diskette, convert any diskette that has an earlier version of DOS, and much more. Programs that demonstrate various capabilities of DOS are also included on the diskette and discussed in the manual.

With approximately 20% more storage capacity per diskette made available by DOS 3.3, you can store even more files on each diskette. Just type SAVE and the file name, and DOS will save it for you.

So that you'll know exactly which programs you've stored to a particular diskette, DOS provides the CATALOG command. When you use it, a list of all the files contained on the diskette will appear on your screen. To access a particular program, simply type LOAD and its name, and within seconds, you'll be using the code you've selected.

System Configuration

DOS 3.3 is included with all Apple II Disk Drives (with controller)*. To use DOS 3.3 and its utilities, you will need the following system:

- Apple II or Apple II Plus, each with minimum of 32K memory.

*If you are currently using a prior version of DOS, you'll need the extra PROMs supplied in the DOS 3.3 Kit before you can run DOS 3.3 (included in the Kit) on your system.

Technical Specifications

Housekeeping Commands:

INIT
CATALOG
SAVE
MAXFILES
LOAD
RUN
RENAME
DELETE
LOCK
UNLOCK
VERIFY
MON
NOMON

Access Commands:

FP
INT
PR#
IN#
CHAIN

Sequential Text File Commands:

OPEN
CLOSE
READ
WRITE
APPEND
POSITION
EXEC

Random-Access Text File Commands:

OPEN
BYTE
CLOSE
READ
WRITE

Machine-Language File Commands:

BLOAD
BRUN
BSAVE

DOS Messages:

DISK FULL
END OF DATA
FILE LOCKED
FILE NOT FOUND
FILE TYPE MISMATCH
I/O ERROR
LANGUAGE NOT AVAILABLE
NO BUFFERS AVAILABLE
NOT DIRECT COMMAND
PROGRAM TOO LARGE
RANGE ERROR
SYNTAX ERROR
VOLUME MISMATCH
WRITE PROTECTED

The DOS 3.3 Package Order No. A2M0004 (Disk II with controller)

With your order for an Apple Disk II with controller, you will receive:

- Apple Disk II with controller;
- DOS 3.3 System Master diskette, including utility programs;
- DOS Version 3.3 Instructional and Reference Manual;
- BASICS diskette;
- Blank diskette.

The DOS 3.3 Kit Package Order No. A2D0023

With your order for the DOS 3.3 Kit, you will receive:

- Two (2) 16 sector PROMs* (P5A and P6A)
- IC puller;
- DOS 3.3 System Master diskette, including utility programs;
- DOS Version 3.3 Instructional and Reference Manual;
- BASICS diskette.

*If you are using the Apple Language System (which already contains these PROMs), the PROMs supplied with the DOS 3.3 Kit will be spares.

apple computer inc.

10260 Bandley Drive
Cupertino, California 95014
(408) 996-1010

This catalogue
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Apple Computer,

MAGIC WINDOW

word processing system

The MAGIC WINDOW transforms your Apple Computer into a sophisticated Word Processor/Text Editor. All types of documents can quickly be written, revised, edited, and printed. MAGIC WINDOW typing is so simple you can perform any editing task with a simple key stroke, from correcting typographical errors to moving paragraphs.

MAGIC WINDOW uses a new and creative software function to allow you to see 80 column paper on your video screen. Four way scrolling gives you the ability to view your full sized letter from any position.

The most impressive feature of the WINDOW is the way it emulates a standard typewriter. You actually can see the edges of the paper you are typing on. This feature lets you position your text on the paper when you type it. You don't need to review your text and insert formatting commands.

You have probably purchased one or more of the peripheral products available for you Apple (language system, lower case adapter, printer, etc.) The MAGIC WINDOW will automatically use these new products if you have them. MAGIC WINDOW will boot on 3.2 or 3.3 DOS systems. And if you have a language system it will use the extra memory.

MAGIC WINDOW uses two types of disk storage, binary files and text files. The text file gives you the ability to load and save files that can be used by other programs. Binary files are used to store your documents, page size and tab stops quickly and completely.

With the MAGIC WINDOW you may never need to hit return. When your text touches the right margin the last word will automatically be picked up and placed on the next line allowing you to continue typing. When you reach the bottom of the page the WINDOW will jump to the top of the next page without causing any interruptions. The search function will help you find any occurrance of a word for correction or deletion.

Text storage, printing, and system configuration are controlled by a unique menu structure. This avoids complicated command sequences. Function selection is simple and syntax free.

Centering and justification is simplified by your being able to see text on the screen. There is no need to print out a work copy of your text.

Unlike other systems that separate the tasks of editing text and formatting for printing, MAGIC WINDOW shows you the exact placement of your text as you type it.

Along with the MAGIC WINDOW you receive:

- *Full color keyboard poster showing all the keystroke commands.*
- *33,000 word Webster Speller/Divider to help you spell correctly.*
- *50 page easy to read manual and padded binder.*
- *Text file of post office approved state abbreviations for quick reference.*
- *Personal phone service for any problems or questions you may have.*
- *Lifetime media warranty.*

ARTSCI INC **(213) 985-2922**
10432 Burbank Boulevard, North Hollywood, California 91601

Bell & Howell Microcomputer Systems

Quality Courseware offers a great deal of potential to the Classroom Teacher who is desirous to provide specialized remedial and accelerated material to students for individualized instruction.

Bell & Howell Computeach Courseware is available on Diskette. Alternative formats are possible for some of the Courseware, details of which may be obtained by writing Bell & Howell.

While Courseware is designed with particular experience levels considered, the general designations are represented with each program as E, S, A, or a combination of these codes signifying Elementary, Secondary, Adult respectively.

BELL & HOWELL COMPUTEACH COURSEWARE

EWS 12	EDU-PAK I Contains 3 skill-enhancing programs on one diskette. For details of programs, consult EWS 12A, 12B, 12C.	(ES)	$ 59.95	48K Applesoft
EWS 12A	COMPU-READ Four independent programs and two file building routines. Designed to rapidly increase reading comprehension and retention. User sets initial difficulty level. Program titles are: Character Recognition; High-Speed Word Recognition; Synonyms and Antonymns; Sentence Comprehension.	(ES)	$ 37.95	48K Applesoft
EWS 12B	PERCEPTION Three separate programs included are: Match Hi-Res lines drawn by computer; Powers of Observation; Distinguish Sizes and Shapes. Employs and challenges visual skills. Simulation controllers required for Match Hi-Res. User determines response times and some presentation formats.	(ES)	$ 29.95	48K Applesoft also: ROM Applesoft
EWS 12C	STATISTICS Statistical calculations developed including: mean, variance, standard deviation, Pearson correlation, normal distribution, probability and frequency, Chi-square distribution, T-test.	(ES)	$ 24.95	32K Applesoft
EWS 13	STORYTELLER English grammar aid re-enforces proper language usage and includes instructional routines which describe and exemplify all major parts of speech. As these are mastered, randomness takes over generating humourous tales.	(ES)	$ 29.95	48K Applesoft

EWS 16	METRI-VERT (ES) Program makes metric conversion easy. Menu driven routines compute conversions for length/distance, area, volume, weight and temperature. Also includes a "display page" which stores results of up to 20 calculations for easy reference.	$ 24.95	32K Applesoft
EWS 24	FRACTIONS (ES) Contains a pre-test and six Learning Units as follows: Definitions, Common and Lowest Denominators, Addition, Subtraction, Multiplication, Division. Each includes the use of both common fractions and mixed numbers. Highly animated and graphic displays hold learner's attention and increases comprehension.	$ 59.95	48K Applesoft
EWS 26	DECIMALS (ES) Contains a pre-test and seven Learning Units as follows: Conversion, Addition, Subtraction, Rounding Off, Multiplication, Division, Percentage. Ease of operation allows users to work unassisted and goes beyond familiar "drill and test" formats.	$ 59.95	48K Applesoft
EWS 99	COMPU-SPELL (ES) This program uses only positive feedback to insure accurate learning. All displays show carefully selected spelling words in carefully selected paragraphs and ask the learner to replicate the correct spelling as the computer patiently monitors progress. An elaborate operating system supports use by many students in a classroom environment. Contains six diskettes.	$ 59.95	48K Applesoft also: ROM Applesoft

MPL 3011	WHAT'S THE SCORE? (ES) This program gives coverage to the following: what scores represent, quantitative variables, categorical variables, simple frequency tables, grouped score frequency tables, frequency graphs and curves. Allows for interaction and experimentation with review opportunities. Employs colour, motion and sound in its tutorial sequences.	$ 37.50	32K Applesoft also: ROM Applesoft
MPL 3021	SPELLING RULES (ES) This Program addresses rules related to: ie or ei; final e; adding k; final consonant; -sede, -ceed, -cede; final y. Employs instruction with illustrative examples, exercises and a mastery quiz in a game format.	$ 37.50	32K Applesoft also: ROM Applesoft
MPL 3031	SENTENCES (ES) Coverage is given to subject of a sentence including identification of the simple subject; the sentence predicate highlighting both "action" and "being verbs"; the fragmented sentence - what it is and what to do about it. Uses instruction with illustrative examples and exercises affording practice opportunities. There is a mastery quiz in an interesting game format.	$ 31.50	32K Applesoft also: ROM Applesoft
MPL 3041	MAP READING (ES) The basic sequence of instruction covers: the compass; the concept of scale; and notation. This program permits the user to set the pace in determing number of examples and exercises and how much and when review is to take place. It is a universal type program for those wishing to master map reading.	$ 24.95	32K Applesoft also: ROM Applesoft

MPL 3051	ON THE AVERAGE (SA) Reviews scores and variables, frequency tables and frequency graphs and curves. This program develops recognition and calculation of mean, mode and median and is designed primarily for those in high school and beyond.	$ 37.50	32K Applesoft also: ROM Applesoft
MPL 3061	ADVERTISING TECHNIQUES (ESA) This program describes four techniques under the headings: join the crowd; decide for yourself; remember me?; act now!. Instruction is enhanced using illustrative examples with exercises affording practice opportunities and a mastery quiz. The user's Consumer Intelligence Level is also determined.	$ 31.50	32K Applesoft also: ROM Applesoft
MPL 3071	CIRCULATION (ORGANS)(ESA) The blood circulation and organs of the human circulatory system is addressed in an interesting manner. Coverage is given to the blood; heart; arteries; capillaries; veins; lungs. The tutorial approach uses colour, motion and sound with reviews quizzes and a fun game to see what was learned.	$ 37.50	32K Applesoft also: ROM Applesoft
MPL 3081	A MEMORY MYTH (ESA) Designed for those who wish to challenge and develop their memory skills. Program is interesting and enables learner to have a good time in reaching objectives. It provides twelve levels of exercises with increasing difficulty. Ability and speed are two key objectives in the program.	$ 24.95	32K Applesoft also: ROM Applesoft

MPL 3091	CIRCULATION (SYSTEM) (SA) The practical functions together with their circulatory interrelationships are covered in this program. In addition to the key organs including topics on the heart and blood, there is detail on the pulmonary and systemic circulation. Excellent graphic detail is employed and numerous review opportunities and quizzes are presented.	$ 37.50	32K Applesoft also: ROM Applesoft
MPL 3101	SIMPLE MACHINES (ES) The Principles and Applications of six simple machines are presented for the lever, pulley, wheel and axle, inclined plane, wedge, screw. Upon successful completion of the program the student should be able to select the appropriate simple machine to use to solve any number of real-life applications.	$ 37.50	32K Applesoft also: ROM Applesoft
MPL 3111	PYTHAGOREAN PROOFS (SA) The Proofs covered by this program are those of: Legendre, Bezout, Garfield, Euclid, Pythagoras and the Chinese. A requisite is a basic understanding of Euclidean geometry and each proof is presented in three parts viz: statement, constructions graphically displayed, and the formal proof allowing the student input.	$ 37.50	32K Applesoft also: ROM Applesoft
MPL 3121	LIBRARY SKILLS (ES) The kinds of reading materials and files are covered in addition to how to find fiction, nonfiction and biographies. Also discussed are the Dewey Decimal System, the Card Catalog and use of Reference Materials. A number of relevant exercises for reinforcement as well as mastery quizzes are used advantageously.	$ 31.50	32K Applesoft also: ROM Applesoft

MPL 4011	SCIENTIFIC METHOD (ESA)	$ 24.95	48K Applesoft also: ROM Applesoft

This program addresses the following topics: Observation: Generalization; Measurement; Verification. An experiment is simulated with boiling water and leads a student through the entire process to enable an understanding of what it is and how it works.

BIO 082	EVOLUT (SA)	$ 45.00 *	48K Applesoft also: ROM Applesoft

Introductory unit in evolution and population genetics. Intended to teach mechanisms and selective process, adaptations, manipulations of models and an investigation of the power of selection. Elementary knowledge of genetics is required. Students select various parameters of model and is involved in testing hypothesis.

BIO 083	ECOLOGICAL MODELING (SA)	$ 67.50 *	48K Applesoft also: ROM Applesoft

This package introduces techniques for modeling ecological systems and processes. Controlling certain parameters the student tests hypothesis and predicts results about ecosystems. Various environmental factors are explored and simulated along with experimental modeling techniques. Supplied with one student manual 76 pages.

BIO 118	COEXIST (SA)	$ 45.00 *	48K Applesoft also: ROM Applesoft

This unit simulates two biological situations. Firstly, three populations are modeled to grow independently on identical limited food resources. Secondly, two populations in competition with each other on the same limited food resources are simulated. Student has control of a number of parameters in the learning experience.

BIO 122	LINKOVER (SA) $ 45.00 * This unit is designed to provide students with the opportunity to plan and execute genetic mapping experiences in order to reinforce learning of the concepts of linkage and crossing-over. Instructions given enable modification of the model to simulate more closely the natural situation. Such possibilities as altering and randomizing number of offspring, gene symbol, adding and removing genes exist.	48K Applesoft also: ROM Applesoft
BIO 181	ENZKIN (SA) $ 45.00* Realistic results occur using program to simulate enzyme-catalyzed reactions. Many cycles of planning experimen-ation and interpretation in a short time are generated. Students are asked to plot progress curves and calculate initial velocities of reactions. Six enzymes with different properties are simulated so that different results can be obtained.	48K Applesoft also: ROM Applesoft
BIO 182	COMPETE (SA) $ 45.00* This program enables students to plan and carry out an investigation without the long delay usually associated with growth experiments. The unit includes investigations with both real and simulated plants, and other relevant data in the form of graphs, tables and descriptions.	48K Applesoft also: ROM Applesoft
CHM 160	RKINET (SA) $ 45.00* The topics covered are chemical reaction kinetics; first and second order reactions, rate constants, concentrations. This simulation is intended to extend student's laboratory experience and understanding of reaction kinetics by enabling a wider range of investigations. Also gained is an appreciation of relationship between mathematical model and reality.	48K Applesoft also: ROM Applesoft

CHM 199 HABER (SA) $ 45.00*

This simulation provides the opportunity to study the Haber process in the production of ammonia and how temperature, pressure, catalyst and reactant concentration ratios influence the course of the reaction, relating to equilibrium time and yield.

48K
Applesoft

also:
ROM Applesoft

PHY 129 SCATTER (SA) $ 45.00*

Three models simulating experiments in particle scattering are represented. Hard massive objects of regular shapes, "inverse-square scatters", alpha particles etc. are simulations observed. Shapes and sizes are generated on a random basis in some instances.

48K
Applesoft
also:
ROM Applesoft

PHY 130 NEWTON (SA) $ 45.00*

This program covers Newton's Laws, gravitation and velocity. It is designed to help the student achieve an appreciation of how the application of Newton's Second Law and Law of Gravitation leads to the prediction of satellite orbits. An interactive method to calculate the path of a projectile launched horizontally is employed.

48K
Applesoft

also:
ROM Applesoft

PHY 183 INTERP (SA) $ 45.00*

Designed to improve student's understanding of wave superposition and use of models in physics, it pays particular attention to the wave theory of light, and how effective the theory is in explaining observed phenomena. The work is intended to encourage a more critical attitude toward use of models by emphasizing and investigating some assumptions.

48K
Applesoft

also:
ROM Applesoft

PSY 224	LABORATORY IN COGNITION AND PERCEPTION (SA) Topics dealt with include cognition and perception, experimental research and design, human information processing. A student is exposed to a variety of phenomena and although classical problems in experimental psychology are presented, the major focus is on contemporary research. Provides some students with skills used by cognitive psychologists in designing and conducting experiments.	$114.00*	48K Applesoft also: ROM Applesoft
MTH 229	ALGEBRA DRILL AND PRACTICE (SA) Covers algebraic signs, operations with numeric and algebraic fractions, percents, equations of lines, simplification of albegraic expressions, word problems. Enables instructors to provide drill, practice and help for students without direct instructor involvement. Problems commence at easy level and progress to sufficiently challenging ones. Detailed step by step solutions are presented. Two diskettes. Student manual included.	$145.00	48K Applesoft also: ROM Applesoft
PHY 003	USING COMPUTERS IN PHYSICS (SA) Partially intended as an introduction to computer use in Physics. Written for introductory general physics course it covers mechanics and numerical integration. Covers instruction in the physics of the harmonic oscillator without calculus for either physics or non-physics majors. An excellent demonstration of microcomputer instructional techniques. Complete with each of teacher and student manuals.	$ 52.50	48K Applesoft also: ROM Applesoft

*Programs so marked are supplied with each of one instructors and one students manual.

MUS 002	THE VOICE The power of speech is provided to the Microcomputer. Standard Voice vocabulary is used to speak an endless combination of phrases and sentences, or user can customize vocabulary for personalized applications. The Editor is employed to record edit and speak any words. The Demo is an assembly language program which combines words recorded using the Voice Editor with color graphics.	$ 65.00	48K Applesoft or Integer
MUS 003	APPILOT EDU-DISK This package includes both high and low resolution graphics, a built-in student timer, Symtec light pen input, mixed hires graphics and text, and voice output using THE VOICE program. Easily creates multiple copies of lessons for student use. Includes a comprehensive user's guide and instructions on an easy straightforward generation of lesson material.	$160.00	48K Integer Basic
PSI 105	VISICALC An electronic worksheet of up to 63 columns and 254 rows. At the juncture of any column and row you can type in words or numbers. To put VisiCalc to work you first create any format or form you need by typing in words - just like writing column headings across the top of a piece of paper and items down the left side. Automatically performs all arithmetic functions etc. and displays results. Budgets, forecasts, rate-of-return, financial statements, tax effects, scientific notation, eleven digit precision - VisiCalc can do it all.	$215.00	32K Applesoft

GRADE SYSTEM $450.00

A complete and easy system which makes possible numerous time saving functions including grading system and programs for up to 600 students on one diskette. Permanent data of each student is cumulated and affords easy change methods. Employs Light Pen as well as keyboard input. Has Honor Roll, Print Report Card, comments and conversions to simplify reporting periods in every school.

THE ELECTRIC GRADE BOOK $ 85.00

Designed as a teacher's aid to keep track of class grades in any subject area. Each class has its own data diskette and simple input of information allows compiling of essential information which is easily modified and viewed at any time. Student averages, relative position in class and other detailed listings are obtainable with visual and hard copy output.

Alf MUSIC SYNTHESIZER $445.00 $380.00**

A simple three-channel synthesizer with direct hardware control of pitch and volume. Other effects can be controlled with software. An Entry program is used to enter and play songs. Notes, rests and other musical parameters are entered in a convenient sheet-music type format displayed on video monitor, and selected from a "menu" of available notes also shown on the screen. Songs created by Entry can also be played back using the Play program. Supplied with one firmware card and audio cable plug-in expansion slot, software diskette and manual.

BELL & HOWELL
AUDIO VISUAL PRODUCTS DIVISION

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Borg-Warner Educational Systems

INTRODUCES...

MicroSystem80™

For more than ten years, Borg-Warner Educational Systems has been one of the nation's most trusted publishers of quality instructional materials. In concept development, reading, mathematics and language arts, the System80 curriculum has become synonymous with practical individualized materials that help teachers teach and help students learn.

Now, as we enter the eighties, we are very proud to introduce a new generation of instructional materials, MicroSystem80.

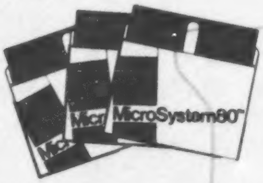
So often, teachers have told us that, while many students are able to read in the sense that they are able to translate words into sounds and may even know what the individual statements of a paragraph mean, they often have difficulty relating those individual ideas within a paragraph to the more comprehensive whole.

The MicroSystem80 *Critical Reading* series is designed to teach students to use logical rules of inference in *understanding* written material.

The reading settings in which each rule of inference is used vary from simple two-sentence stories to longer paragraphs. Each rule is taught by example; first, in the simplest setting and then in contexts which grow increasingly more complex. The design of the program leads the student through a hierarchy of skills and levels of difficulty. *Critical Reading* not only will help students to master rules of inference, but will also help them to develop an understanding of the *meaning* of paragraphs while strengthening their general skills of comprehension.

One of the most valuable aspects of Computer Assisted Instruction is its capacity to adapt programming instantly in response to the individual requirements of the student. Thus, the MicroSystem80 *Critical Reading* series is ideal for teachers who are seeking precise materials which will not only help students to read at grade level but will help them to read with satisfactory *comprehension* as well. Because of its self-pacing capabilities, *Critical Reading* also is highly appropriate for advanced and gifted students.

Each level of *Critical Reading* begins with a pretest to determine exactly where a student should begin working in the program and concludes with a post test to assess mastery. During the course of the program, intermediate progress checks provide the student with immediate feedback and reinforce his or her sense of self-accomplishment.



MicroSystem80 also enables the teacher or aide to review the progress of a single student or that of an entire class at any time. All records are immediately accessible.

The initial materials in the MicroSystem80 *Critical Reading* series are designed for developmental use in the third through the sixth grades and are highly effective for remedial use in middle school and junior and senior high school. Additionally, *Critical Reading* is ideal as a refresher program for students preparing for any standardized achievement tests that include reading comprehension passages.

It was during the 1960's that American educators in large numbers began to make use of available technology to help them in the classroom. Today, the microcomputer represents the second phase of this technological adoption. Both teachers and students are reaping many of the benefits that microcomputers make possible. However, we are once again experiencing a situation in which there is a scarcity of professionally-developed instructional software that is designed to take full advantage of the microcomputer in the school.

Borg-Warner Educational Systems has always been in the vanguard in adapting the latest in technological advancements to practical classroom use. Just as importantly, throughout the years we have remained totally committed to the exhaustive prepublication validation that results in instructional materials in which teachers place complete trust.

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In addition to regular extensions of the *Critical Reading* series, a complete library of MicroSystem80 instructional materials is now in the development stage with additional releases planned for this fall. Included among these are:

- Mathematics Problem Solving
- Computational Skills
- College Entrance Examination Preparation

For more detailed information on the MicroSystem80 *Critical Reading* series, please complete the coupon below and return it to us today. For even faster service, please call our toll-free number, (800) 323-7577, any time during regular business hours, Central Time. When calling from within the state of Illinois, the toll-free number is (800) 942-6995.

Please send me more information about the MicroSystem80 *Critical Reading* series.

Name Position

School

School Address

City State ZIP

( )
Telephone Best time to call

Please return coupons to:

MicroSystem80
Borg-Warner Educational Systems
600 West University Drive
Arlington Heights, IL 60004

instructional courseware

Catalog Code	Description	Price
CR-AH*	*Critical Reading* Lesson Series A-H Includes 8 disks with management system and *Teacher's Guide*	$ 750.00
CR-AD*	*Critical Reading* Lesson Series A-D Includes 4 disks with management system and *Teacher's Guide* Suggested use: Developmental: grades 3 and 4 Remedial: grades 5 and 6	$ 350.00
CR-EH*	*Critical Reading* Lesson Series E-H Includes 4 disks with management system and *Teacher's Guide* Suggested use: Developmental: grades 5 and 6 Remedial: grades 7 and 8	$ 400.00
CR-REP-A	Replacement disk — Lesson Series A	$ 87.50
CR-REP-B	Replacement disk — Lesson Series B	$ 87.50
CR-REP-C	Replacement disk — Lesson Series C	$ 87.50
CR-REP-D	Replacement disk — Lesson Series D	$ 87.50
CR-REP-E	Replacement disk — Lesson Series E	$ 100.00
CR-REP-F	Replacement disk — Lesson Series F	$ 100.00
CR-REP-G	Replacement disk — Lesson Series G	$ 100.00
CR-REP-H	Replacement disk — Lesson Series H	$ 100.00

*Currently available for use on Apple II Plus System — 48K RAM with Applesoft BASIC 5¼" disk input and video display. Integer BASIC and D.O.S. 3.3 versions available on request. Not available on cassette.

replacement disk procedure

Borg-Warner Educational Systems will replace any defective disk upon request. The inoperative disk should be sent to Borg-Warner Educational Systems, 600 West University Drive, Arlington Heights, IL 60004. Each disk should be accompanied by a check or Purchase Order for $5.00 to cover the cost of handling and shipping.

terms and conditions of sale

Borg-Warner Educational Systems must receive a signed Purchase Order or purchase authorization before any order can be honored. All items will be shipped, prepaid, Best Way, F.O.B. Arlington Heights, IL. There is a 10% restocking charge on all returned or exchanged materials and all prices are subject to change without notice.

limited warranty — instructional courseware

Borg-Warner Educational Systems (BWES) shall not be responsible or liable for the use or misuse of MicroSystem80 instructional courseware. The purchaser assumes all responsibility for the use or misuse of same. Unless expressly agreed to in writing by BWES, all MicroSystem80 instructional courseware is sold without warranty expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose; return and replacement of materials as described herein and/or refund of purchase price at the sole option of BWES is the sole and exclusive remedy and is in lieu of actual, consequential, or incidental damages for use or misuse of BWES materials and services and, in no event, shall BWES liability exceed the purchase price of said materials.

for additional information

on MicroSystem80 courseware or any other System80 product, please call our toll free number, (800) 323-7577. When calling from within the state of Illinois, the toll free number is (800) 942-6995.

MicroSystem80™

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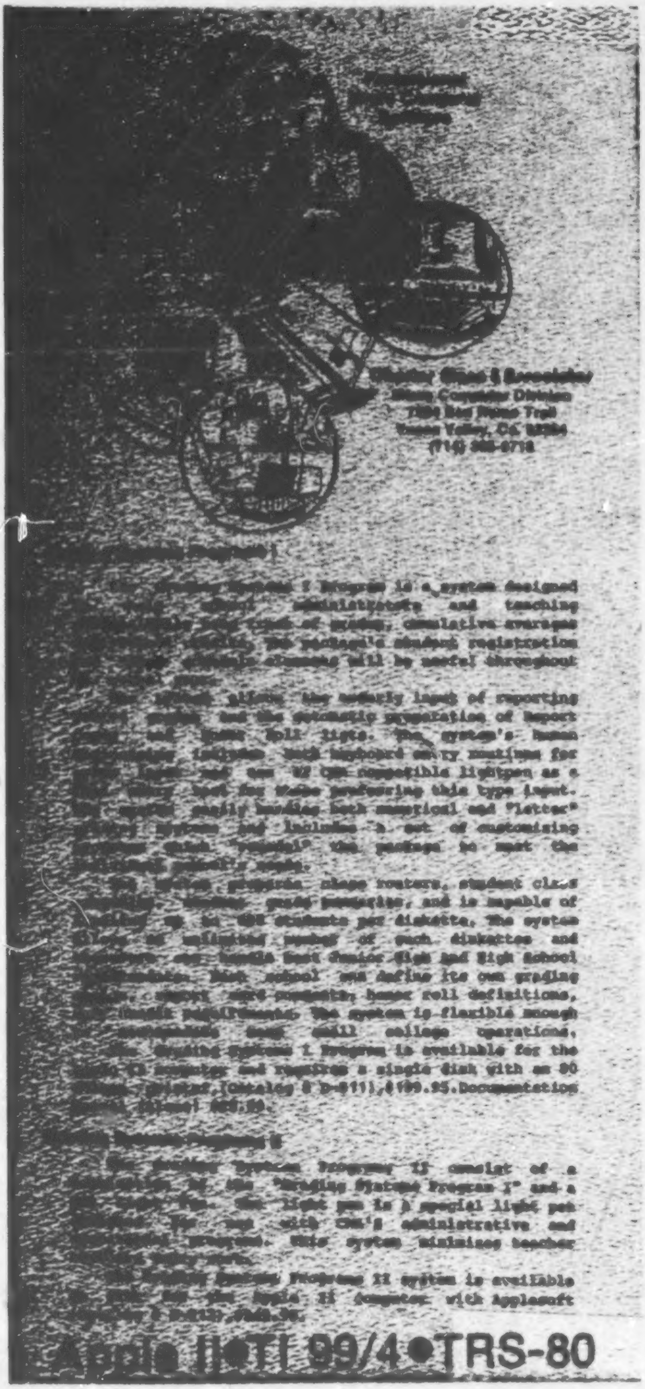
Arlington Heights, Illinois 60004


Apple II•TI 99/4•TRS-80

The Teacher Plus

The Teacher Plus program is a lesson oriented teaching system which is designed to operate on Apple II Plus computers and Apple II systems equipped with ROM Applesoft. The eighteen lessons are constructed to aid the student in learning the operating requirements and command system for BASIC programming in Applesoft.

The system's two disk package supports all major programming capabilities of Applesoft including the Apple's sound and graphics capabilities. Each lesson progressively instructs the user in BASIC using a conversational approach. The package is written to teach without workbooks. Only Apple Reference Manuals are needed as supplements.

The program is available for Apple II Plus and Apple II's with Applesoft (Catalog # D-035) at $39.95 on disk, and (Catalog # T-035) for $34.95 on tape.

Floating Point Dictionary

The Floating Point Dictionary is a complimentary program for "The Basic Teacher" and "Teacher Plus" systems. It is a full disk of programs which helps the computer programming student learn Apple's Applesoft Basic programming language. Not only does this package serve as a valuable teaching tool, but it is indispensable as a permanent reference. Just like referring to a reference book, the student can seek information and definitions from the dictionary.

Working examples of statements are formed on the screen as well as definitions. Practice test programs are also given that assist the student in viewing the results of the commands they used. If in real trouble, the student can ask for a special HELP command that will provide the correct command to look up.

The program is available on disk for Apple II computers with Applesoft (Catalog # D-028) at $29.95.

Teacher Plus Pac

The Plus Teaching Pac is a specially priced twin package consisting of the "Teacher Plus" and "Floating Point Dictionary". The program is designed for Apple II computers with ROM and the Apple II Plus computer. The system, as described above, is a full teaching and reference package for Applesoft II.

The disk based Apple II system with Applesoft is available for $69.95, (Catalog # D-040).

The Basic Teacher

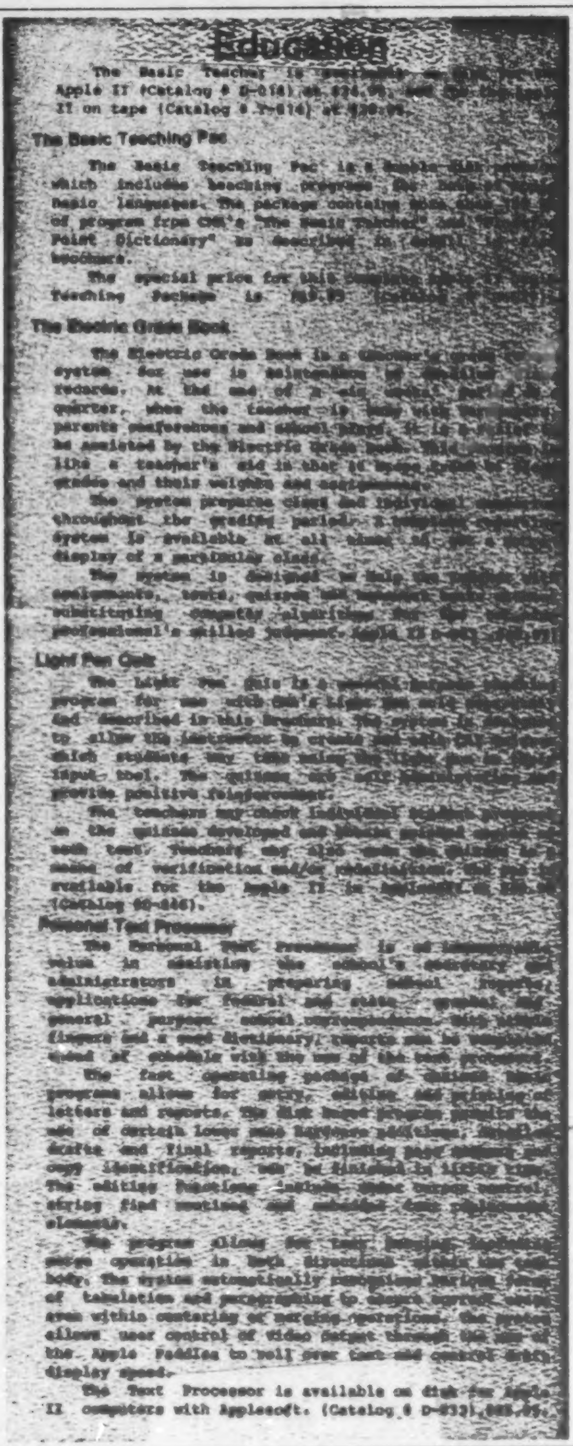
The Basic Teacher was designed with the novice computer programmer in mind. The program will help you learn the Basic language through an easy daily conversation with the Apple.

In its first twelve lessons the student is introduced to the commands of Integer Basic. Included are such statements and commands as GOTO, IF-THEN, FOR-NEXT, STEP, ABS, SGN, RND, LEN GOSUB-RETURN, PEEK, POKE, CALL, GR, LIST, NEW RUN, TEXT, TRACE, PDL, COLOR, DIM, END, INPUT, NO TRACE, PRINT, TAB AND VTAB.

While communicating with the language the student is taught how to load and run programs, use control functions, grasp mathematical operations, and understand logical relationships, loops, strings, arrays and conditional jumps.

Sample tests and review sections are incorporated within the assignments so that the student can master each lesson as he goes along. The student is taught how to write sample programs and given a general index to assist him with programming problems.

The Baker's Dozen programs are completed by a program called Apple Tricks. This program uses graphics and sound to teach the uses of many peeks, pokes and calls into Apple's Basic. The program requires 16K of free RAM.



Education

The Basic Teacher is [illegible] Apple II (Catalog # D-014) at $[illegible] [illegible] II on tape (Catalog # T-014) at $[illegible].

The Basic Teaching Pac

The Basic Teaching Pac is a [illegible] which includes teaching programs [illegible] Basic languages. The package contains [illegible] of program from CM's "The Basic Teacher" and "[illegible] Point Dictionary" as described in [illegible] brochure.

The special price for this [illegible] Teaching Package is $[illegible] [illegible]

The Electric Grade Book

The Electric Grade Book is a [illegible] system for use in maintenance of [illegible] records. At the end of a [illegible] quarter, when the teacher is busy with [illegible] parents conferences and school [illegible], it is [illegible] be assisted by the Electric Grade Book. [illegible] like a teacher's aid in that it [illegible] grades and their weights and assignments.

The system prepares class and individual [illegible] throughout the grading period. A [illegible] system is available at all times [illegible] display of a particular class.

The system is designed to help the [illegible] assignments, tests, quizzes and [illegible] substituting computer algorithms for the [illegible] professional's skilled judgment. Apple II [illegible]

Light Pen Quiz

The Light Pen Quiz is a [illegible] program for use with CM's Light Pen [illegible] and described in this brochure. The system is [illegible] to allow the instructor to create and edit [illegible] which students may take using the light pen [illegible] input tool. The quizzes are [illegible] provide positive reinforcement.

The teachers may check individual [illegible] on the quizzes developed and [illegible] each test. Teachers may also [illegible] means of verification and/or [illegible] available for the Apple II in [illegible] (Catalog [illegible]-046).

Personal Text Processor

The Personal Text Processor is of [illegible] value in assisting the school's secretary and administrators in preparing school reports, applications for federal and state [illegible], and general purpose school correspondence. With [illegible] fingers and a word dictionary, reports can be [illegible] ahead of schedule with the use of the text processor.

The fast operating package of [illegible] programs allows for entry, editing and printing of letters and reports. The disk based program permits the use of certain lower case hardware additions. [illegible] drafts and final reports, including page [illegible] copy identification, can be finished in [illegible] The editing functions include [illegible] cursor control, string find routines and [illegible] elements.

The program allows for text [illegible] merge operation in both directions [illegible] body. The system automatically [illegible] of tabulation and paragraphing to [illegible] even within centering or merging operations. The system allows user control of video output through the use of the Apple Paddles to roll over text and control [illegible] display speed.

The Text Processor is available on disk for Apple II computers with Applesoft. (Catalog # D-033), $[illegible].

Statistics Pac

The Statistical Pac is designed for the scientist or doctor working in the lab, the educator correlating test results, or the mathematician calculating his modes, medians and means. The system includes its own data base management system (also available separately) and a battery of programs for curve fitting, probability and general statistics.

The system features HIRES plotting of all curve fitting problems allowing all relations to be viewed on the screen. The general statistics element includes standard resolution plots for appropriate histograms and distribution arrays.

The system probability elements include analysis for permutations, combinations and factorials. The random number generator routines include elements for random number tables, random numbers within intervals or one-by-one for game theory. The distributions include Binomial, Poisson, Normal, Chi-Square and Student-t Distribution. Many distribution probabilities may be estimated above a point, below a point, inside a symmetric interval, inside a defined interval, outside a defined interval or outside a symmetric interval.

The system is available on disk for Apple II computers with Applesoft (Catalog # D-030), and for the TRS-80 Model I Level II Computer (Catalog # D-036), $89.95.

Scientific Data Base

The Scientific Data Base System is a special purpose data system for your own scientific and statistical programs. You can design your own applications software and forget about the data base handling problems.

The Scientific Data Base System allows for storage of scientific and other numerical information up to 500 elements for each file. Additionally, each file may have up to 5 hierarchal names. Users may enter, store, edit, add to, or delete files or single elements within the files. The system is designed for programmers who wish to have a general purpose data manager for their own personally developed scientific analyses programs. The system includes documentation which will assist the programmer in designing his own custom applications.

The program on disk is available for the TRS-80 Model I Level II Computer (Catalog # D-037) and for the Apple II Computer with ROM II Applesoft (Catalog # D-031);$49.95. (The system is included at no additional cost in Statistical Package).

The CMA Light Pen is available for the teacher or administrator who prefers to use this fast entry tool rather than using the keyboard. This handy electronic pen is available for $49.95 (Catalog # D-008).

Personal Secretary

The Personal Secretary Package was developed around a major bank's concept to help improve efficiency in clerical personnel's daily tasks. When the bell is ringing and students are still standing in line for absentee slips to be processed (Excused of course), don't be dismayed! The secretary or office assistant will not be totally exhausted when he/she can finally sit down, power up the computer, and scrutinize the screen to check the office's schedule for the day.

By merely asking a few simple questions the office worker can track down phone numbers, review any appointments for the day and file records. An organized list of "things to do" compiled from the previous day helps to get the day off to a better start.

The Personal Secretary is available on disk for the Apple II computer in Interger Basic.(Catalog # D-002),$29.95.

The Grading Systems Program III includes the teacher's aid "The Electric Grade Book", "The Grading Systems Program I" and the CMA Light Pen. With the total system, both administrators and faculty can spend fewer hours at school and take home a smaller stack of homework papers to grade.

The complete system is available on disk for the Apple II computer with Applesoft (Catalog # D-013), $299.95.

The Counsellor's Program

The Counsellor's Program operates in conjunction with CMA'S "The Grading Systems Programs". With this program, the school's guidance counsellor can easily prepare master student records and file folder labels.

The system reads "The Grading Systems Programs" master student records and prepares semester-by-semester summaries of student grades. The system can be used to update counsellor files at each quarter or semester and obtain details as necessary including teacher progress comments. The system also prints updated student file folder labels which include such information as the student's current class-by-class grade average. The system is designed to prepare all necessary information for career guidance and recommendations on additional course work required.

The Counsellor's Program is available on disk for the Apple II computer with Applesoft (Catalog # D-038), $89.95.

The Class Scheduling Program

The Class Scheduling System is a package of programs designed to aid school administrators and match individual student course requests with available course and section offerings. The system allows schools to test various proposed course offerings for conflicts and suitability. It ultimately developes closely matched needs and offerings into a final master class schedule and individual class schedules. The system allows priority assignment for required courses and selection of the best available elective courses. The system also will schedule lunch periods and study halls as needed.

The system will print all required reports and forms and the final magnetic copies of the schedules can be used in CMA's "The Grading Systems Programs" (described elsewhere in this brochure). Counsellors can use CMA's "The Counsellor's Program" to assist in initial system input.

The system will handle up to 2,400 students per run with multiple runs for each class year possible. The system will handle up to 1,000 courses with up to 16 course choices and alternatives per student. The system requires 48K and 2 disk drives. The system is designed for the Apple II computer with Applesoft. It is priced at $249.95 (Catalog #D-039). The operating manual can also be purchased separately for $25.00.

CMA Light Pen

The CMA Light Pen is a specially manufactured ligh pen designed as an "easy input" tool for CMA' educational products. The Light Pen requires no fre slot for operation and is easily plugged in as neede for easy input. The Light Pen is provided free wit "The Grading Systems III" and is available separatel for additional machines on school site. This hand electronic pen is available for $49.95. (Catalo #D-008).

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COMPRESS

Biobits

LIFE +

Some years ago, a mathematician invented a game, "Life," in which elements in a grid reproduce, maintain, or extinguish themselves, according to a set of formal rules. Martin Gardner (**Scientific American** 223:120, 1970) described Conway's game and how to play it on a sheet of paper. A computer can act as a writing tablet, however, and allow the game to be more exciting.

LIFE DISK contains programs that play Conway's original game and also more complicated versions of it that make and modify clones. If you play the original game you should be able to infer the rules by which objects appear and disappear on the grid. If you choose the clone generator you may look at: passive growth, active growth, simple change and differentiation.

The rules for birth and extinction (or differentiation) are the same as in the Conway game, with an important exception: growth occurs at one point only in the first three modes. All objects formed in a single set of generations have the same color, distinguishing them from earlier (and later) sets.

Passive Growth establishes a growth mode and continues from there outward. Under some circumstances objects grow back on the main clone. You can see this best if you make each set of generations small: everything has a uniform color when the sets are large.

Active Growth begins with a single mode but, when extinction occurs, a new mode forms. Growth points thus appear to jump over the surface of the clone.

Simple Change allows differentiation to occur instead of extinction some stated percent of the time. You will be asked to specify this percentage. Try different values to see the effects of changing probabilities on differentiation.

Differentiation produces massive changes from generation to generation, after the first few generations of simple growth. The rules don't change, but lead to progressively greater expression of difference. Note how little of prior generations persists from one differentiated state to the next.

This program is intended for use in courses in General Science, Finite, Mathematics, Set Theory, Computer Science, and of course, high school and Introductory College Biology.

The Programs:

LIFE: *This program lets you play the original Conway game of "Life". It applies a simple law to a pattern of individuals, changing their distribution by allowing reproduction or imposing extinction or both. It also complicates the rules, permitting individuals to differentiate as well as merely divide or die. The program will display changes for as many generations as you choose. You may also choose to interrupt the program between generations, in order to observe the patterns at leisure or to guess the rules of LIFE.*

SUPER LIFE: *Super life establishes a clone to your specifications, lets it grow, respond to crowding, differentiate, or come apart in fragments.*

B-1 APPLEPACK includes: DISKETTE
1 copy explanatory manual THE TRUTH ABOUT TRIBBLES
$50.00

Discovery Park
University of Victoria
P.O. Box 1700
Victoria, B.C. V8W 2Y2
Tel. (604) 477-7246

2
Biobits
MAGIC FLAG
PRESS TO
CONTINUE
T.B.Roos
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T.B. Roos' striking visual displays make learning the basics of scientific method a delight. Magic Flag illustrates the difficult concepts of entropy and randomness by showing how patterns destroy themselves when forced to change in accordance with their environment. It makes no difference whether the original pattern is random or ordered, its eventual fate is uniformity.

This APPLEPACK may be used in Finite Mathematics, Elementary Physics, Introductory College and High School Biology, Genetics, and Evolution.

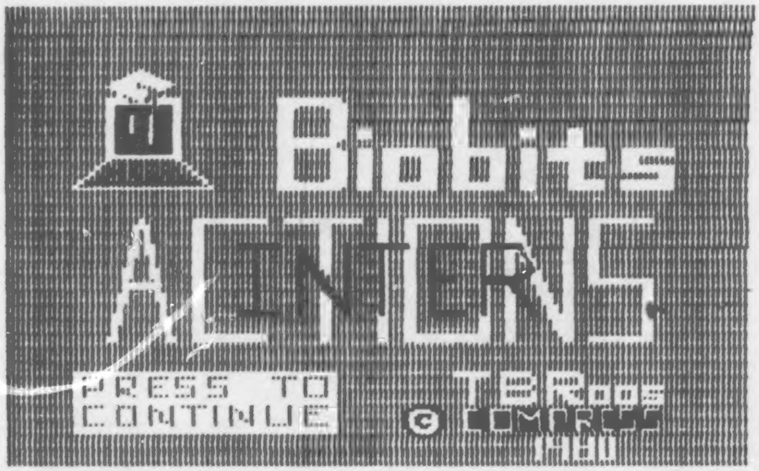
The Magic Flag changes its spots, depending on their color or the color of their neighbors. You may start with a randomly spotted flag or with a recognizable, national flag. Left to its own devices, the Magic Flag will have 64 spots with five different colors. At your choice it can have up to 1444 spots with 15 colors; the colors may occur with equal probability or with probabilities you select.

With each wave of the flag every spot is compared with the spots above, below, and on either side. At random its color is either changed to that of one of its neighbors, or if you permit it, kept unchanged. Eventually one of two things will happen: either the flag will have only one color or will assume a regularly changing checkerboard.

The Program:

The Magic Flag changes its spots depending on the color of its neighbors and itself. Start with a national flag or one of your own design and test your ability to predict the outcome.

B-2 APPLEPACK includes: DISKETTE
Student Pamphlet
$25.00



The interactions between populations are easy to understand when you use this APPLEPACK interactive program. Colorful graphs make this model based on the Volterra-Lotka equation accessible to even the beginning biology student. Up to five populations can interact as competitors, prey, or predators to illustrate stable, cyclical and castastrophic relationships.

Suggested courses include: High School and College level Introductory Biology and Ecology, Environmental Studies, Policy studies, and Economics.

Communities have many populations which interact in various ways, enhancing or decreasing each others' chances for survival.

Population Interactions links the behaviors of two or more populations (up to five) through "coefficients of interaction". Positive interaction occurs among competing populations: the presence of one decreases the size of the other. Negative interaction occurs when the presence of one population improves the prospects for increase in another. What happens when one population competes with another for nutrients, when members of one eat members of the other, and when both prey on each other? With this model the student can discover for himself.

By including more than two populations you can see effects of competition among prey and among predators, as well as both eaters and eaten.

The model is based on the Volterra Lotka equation. It will run using either fixed or varying carrying capacities, as you choose.

The Program:

INTERACTIONS - *occur between populations in either of two ways: Positive or negative. In positive interactions, the presence of one population lessens the number present in another. In negative interactions one population causes an increase in the size of another. This model can show the interactions in as many as five populations.*

B-4 APPLEPACK includes: DISKETTE
Student Pamphlet
$50.00

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PROFILE

This program is designed to be used in classes in Introductory Biology and Ecology, Anthropology, Sociology, History, Policy Studies, Economics.

Your students will enjoy learning about the reproductive capability of populations when they use this APPLEPACK interactive computer-simulated laboratory.

In this program a population has structure in terms of the numbers of males and females present in each age group over the entire life span of the population. This structure remains stable when the factors that determine it don't change. Catastrophes produce dramatic, but transitory, changes in the population. Removal of the catastrophic conditions allows underlying conditions to reassert themselves, leading eventually to a restoration of the original structure.

Stable populations appear to have either a pyrimadal or a columnar distribution. The former shows sharp reductions in successive age classes, with many young individuals and progressively fewer older ones. In consequence the average age is low. Pyramids occur when infant mortality is high and survivorship (from year to year) is low. Columns occur when infant mortality is low and survivorship (from year to year) is high. Columnar distribution occurs when survivorship is high and most individuals remain alive until near their genetic age maximum.

The student may construct a population or use the sample population. He has control over such factors as age, birth rate, survivorship, juvenile mortality and others. The clear, detailed COLOR graphics vividly illustrate the population profile as it changes from year to year or decade to decade.

After each set of computations a histogram appears showing the generation, the number of young born, the total number of individuals alive, and the number in each age class.

The program is designed to encourage systematic exploration of each factor. Students will learn to recognize distribution profiles for different structures easily and quickly with PROFILE's charts and graphs.

The Program:

PROFILE: *calculates age and sex distribution for stable and unstable populations. User can determine population characteristics.*

B-5 APPLEPACK includes: DISKETTE
Student pamphlet
$50.00

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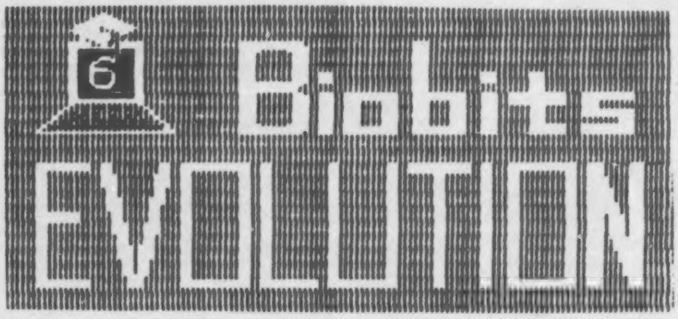

Biobits EVOLUTION

The programs in this APPLEPACK illustrate a number of phenomena associated with evolution. Taken as a whole they illustrate both selective and non-selective ways in which populations change. These class-tested programs are designed for courses in Introductory Biology, Anthropology, Genetics, Evolution, and Human Genetics.

In this package as well as in real life, evolution changes populations of organisms until they can no longer exchange genes with related populations. Occassionally it occurs with a rush, through changes of chromosome numbers. Usually, it occurs slowly through a gradual accumulation of genetic mutations. These mutations show up as novelties in color, shape, behavior or physiology. Charles Darwin suggested that these novelties provide the basis for natural selection, the favoring of one individual over others in the reproductive sweepstakes. They also provide pockets of variation which, if isolated, can drift towards genetic isolation from their cousins.

In large populations, uninfluenced by mutation, selection or migration, the frequencies of alternative genetic forms, alleles, remain constant. Use the Hardy-Weinberg program to see the way by which these factors can guide changes in allele frequencies.

Genetic drift can lead to allele extinction in small populations. You can see it numerically by choosing a small population size in the Hardy-Weinberg program. You can see it diagrammatically by using the Genetic Drift program. The color graphics aid users in visualizing and understanding these concepts of evolution.

The Programs:

HARDY-WEINBERG - *The Hardy-Weinberg model illustrates changes in allele frequencies from generation to generation. Mutation, selection, and migration alter the frequencies of alleles and proportions of phenotypes. Lacking outside influences the ratios remain constant, except for random fluctuations known as genetic drift that affect small populations.*

Specify whatever values you wish for population size, recessive allele frequency, immigration or emigration, mutation, and selective fitness for recessives, dominants, and heterozygotes. The model has an illustrative set that quickly goes to the elimination of one allele.

GENETIC DRIFT - *This program illustrates random changes in the distribution of individuals in small populations with time. Up to 16 different species can occur in one population.*

PALINGEN - *Palingenesis is the tendency toward acceleration or retardation of development during evolution. Palingenesis expresses the idea that, over evolutionary time, species change seems to involve either recapitulation or paedomorphosis:*

Discovery Park
University of Victoria
P.O. Box 1700
Victoria, B.C. V8W 2Y2
Tel. (604) 477-7246

Recapitulation occurs when organisms seem to pass through ancestral stages on their way to reproductive maturity.

Paedomorphisis occurs when organisms appear to become sexually mature as juveniles.

Paedomorphosis and recapitulation can both occur by processes of acceleration or retardation of the gonads and the soma. Retarded gonadal development leads to bodily enlargement, hypermorphosis, accelerated development to progenesis. Retarded somatic development leads to neoteny, accelerated development to recapitualtion.

ALLOMETRIC GROWTH - *Shows how differential rates affect growth in up to five different organs.*

B-6 APPLEPACK includes: DISKETTE
Student pamphlet
$80.00

DESCRIPTIVE STATISTICS

By: Harrison D. Weed, Jr.
Mathematica, Inc.

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Designed to be a brief supplement to standard textbooks on elementary statistics and probability. Provides a discussion of methods and their intelligent uses in descriptive statistics, as well as an introduction to statistical calculations *using the computer*.

Various methods for describing and summarizing raw data are discussed.

Problem assignments are computer oriented.

The programs:

GROUP: *This program computes:*
- *The Grouped Mean*
- *Variance*
- *Standard Deviation for Continuous Data.*

STATMEAS: *Given a set of data this program will:*
- *Order the Data*
- *Compute Measures of Location*
- *Compute Measures of Dispersion*

Data may be entered from a file or from the keyboard.

FREQDIST: *For a given set of data, this program:*
- *Constructs a Frequency Distribution*
- *Graphs a Frequency Histogram*

FREQTAB: *For a given set of data, this program:*
- *Constructs a Frequency Table*
- *Plots a Line Graph*

AP-7 APPLEPACK includes:

Text: **DESCRIPTIVE STATISTICS**	58pp.	5½" x 8½"	$ 9.95
Package: Student manual & diskette			$60.00

Table of Contents

To the Instructor
Chapter I. Introduction
Chapter II. Data and Frequency Distributions
  A. Classification of Data
  B. Frequency Tables and Line Graphs
  C. Grouping of Continuous Data
  Exercises
Chapter III. Descriptive Statistics: Measures of Location
  A. Measures of Location
  B. Arithmetic Mean
  C. Alternative Calculation of Arithmetic Mean
  D. Arithmetic Mean of Grouped Data
  E. The Median
  F. Other Measures of Location
  Exercises
Chapter IV. Descriptive Statistics: Measures of Dispersion
  A. Measures of Dispersion
  B. The Range
  C. Deviations about the Mean
  D. Mean Absolute Deviation
  E. Mean Square, Variance and Standard Deviation
  F. Tchebychef Inequality
  G. Variance and Standard Deviation for Discrete and Grouped Data

ENERGY AND ENVIRONMENT

Allan R. Evans

Present Affiliation: Argonne National Laboratory

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This material is intended for use in courses dealing expressly with environmental problems, or as supplementary material in traditional physics or physical science courses.

Emphasis is on physical principles, model formulation, and quantitative solutions, with the computer used in an interactive mode for instruction and calculation. Essential introductory material studies the tools of quantitative reasoning, including concepts of rates of change and functional dependencies.

The Programs:

*PROFILE - *Calculation stable age distributions for stationary and growing populations using U.S. mortality statistics (1967)*

*POPULATE - *To simulate a dynamic population, allowing the user to enter appropriate population statistics or use those for the United States.*

*ABSORB - *Calculates earth surface temperature for various carbon dioxide concentrations using one-layer model of atmosphere with simple absorption.*

*GLACIER - *Solves Budyko's model (Tellus, 1969). Shows latitude dependent temperature for changes of solar constant albedo varies from .32 to .62 depending on temperature.*

AP-1 APPLEPACK includes:

Text: **ENERGY AND ENVIRONMENT**	265pp.	5½" x 8½"	$ 8.95
Package: Text and diskette			$65.00

TABLE OF CONTENTS

Growth, Change, and the Scale of Problems

- Trends and How Things Grow
  - Electrical energy consumption
  - Simple and compound growth
  - Compound growth of population
- Growth and Consumption in the Environment
  - Electrical energy consumption
  - U.S. population growth
  - Motor vehicle population
  - Total energy consumption
  - Electrical energy and total energy consumption
  - Level of economic activity
- The Problem of Human Population
  - Growth of population - characteristics
  - Growth of population - models

The Energy Balance of the Earth

- The Scale of Human Intervention
  - Energy consumption
  - Alteration of the earth's surface
  - Air pollution
  - Global Temperature increase
  - Climatic change in cities
  - "Fire and Ice"
- The Earth as a Blackbody
  - Absorption and radiation of solar energy
  - Physics of blackbody radiation
  - The atmospheric greenhouse
- Climatological Models
  - The glass greenhouse
  - The atmospheric greenhouse
  - Model of glacier growth
  - More detailed climatological models
- Evolution of Climate

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INTRODUCTION TO PSYCHOLOGICAL STATISTICS:

A Computer-Oriented Approach

By: Janet Price *Psychology Department*
Knox College

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This text is intended to be used as the sole text in an undergraduate course in psychological statistics of the sort typically required of psychology majors. In the introduction the author states:

The primary aim is to teach the student to understand and be able to use those statistics that he or she is most likely to want to use as an undergraduate psychology major. The second major aim of this text is to give a reading knowledge of some kinds of multivariate analysis.

This text is written in accordance with the belief that *understanding* refers to a correspondence between a set of theoretical statements and a nonverbalizable set of hunches, expectations, and intuitions. It is possible to memorize a theory without understanding it at all. This text is aimed not only at presenting the student with a number of precisely stated rules and formulas, but also at helping him or her to develop statistical intuition.

This text is computer-oriented; however, the computer is used in this course simply as a tool. Students will not learn to *write* computer programs, but will learn how to *use* computer programs when they can be helpful. Using the computer will make it possible to work through realistic data analysis problems without getting lost in masses of arithmetic.

This text uses very little mathematics beyond arithmetic and a review of the mathematics it does use is in the appendix.

The first four chapters of this book are concerned with the descriptive use of statistics. Chapters 5 through 13 are concerned with the inferential use of statistics.

The programs:

1. *This program computes the first three moments about zero from an ordered set of numbers.*
2. *This program computes the first three moments about zero from a frequency distribution.*
3. *This program computes the first three moments about the mean from an unordered set of numbers.*
4. *This program computes the first three moments about zero and about the mean for a frequency distribution.*
5. *This program generates rectangularly distributed random numbers.*
6. *This program generates rectangularly distributed random digits.*
7. *This program generates samples of random digits.*
8. *This program computes the mean and standard deviation (biased and unbiased) of a set of unordered numbers.*
9. *This program computes the correlation between two variable.*
10. *This program computes the correlation of X and Y, the regression of Y on X, the predicted Y's, and the residuals.*
11. *This program computes the between groups and the within group sums of squares.*

12. *This program gives you practice in estimating the mean, standard deviation and skewness measure.*
13. *This program gives you practice in estimating the likelihood of getting sample means higher or lower.*
14. *This program is designed to give you some practice in acting as a scientific decision maker.*
15. *This program is designed to give you practice in estimating the size and significance of correlations.*

APPLEPACK includes:

Text: **INTRODUCTION TO PSYCHOLOGICAL STATISTICS**	345pp.	5½" x 8½"	$ 9.95
Instructors Manual			$ 2.00
Package: Student manual, instructor's manual, diskette			$60.00

Table of Contents

Introduction
Chapter 2: Describing Sets of Numbers
Chapter 3: Descriptive Statistics
Chapter 4: The Relation of a Single Number to a Set of Numbers
Chapter 5: Random Samples and Sampling Distributions
Chapter 6: Statistical Inference
Chapter 7: Statistical Inference Continued
Chapter 8: Simple Correlation
Chapter 9: Linear Regression Analysis
Chapter 10: Other Correlation Techniques
Chapter 11: Analysis of Variance
Chapter 12: Complex Analysis of Variance
Chapter 13: Choosing the Appropriate Form of Statistical Analysis
Appendix A: Statistical Tables
Appendix B: Ranoom Number Distributions
Appendix C: Review of Arithmetic
Appendix D: Introduction to BASIC

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MENDELIAN GENETICS:
A Problem Solving Approach

By: Ruth C. Vonblum
Thomas Mercer Hursh
Donald C. Gillis

©Regents of the University of California

These class tested materials are designed to teach Mendelian Genetics in a context which emphsizes solving problems and building scientific models as aids to predicting further observations. They begin with a very simple "tentative explanation" of how traits are inherited or populations grow. The student then compares this explanation with new observations, and sequentially throughout the tutorial is required to modify or expand the explanation, observe again, and tentatively explain, predict, and test new concepts as presented until, after many revisions, a wide variety of phenomena can be predicted accurately.

Each section ends with a self-test on the concepts presented and a summary of the explanation as it has been developed to that point. These explanations are always constructed with respect to an explicit collection of concepts and principles developed to that point in the tutorial.

Numerous problems are provided thoughout, and complete solutions appear at the end of texts.

The program:

GENIE: *is an interactive computer-simulated laboratory in Mendelian Genetics written in BASIC. It can simulate a wide range of genetic phenomena including dominance, partial dominance, lethality, linkage, and sex-linkage. As many as three traits may be simulated at any relative map location on the same or different chromosomes. Multiple allele system may have as many as five alleles and may display any possible combination of dominance and partial dominance. Use of the program is divided into units within which specific phenomena are explored according to instructor specifications.*

In the TEST mode the student is presented with a series of sample populations whose genetic characteristics are determined by instructor specified templates. The student must diagnose the characteristics by making a series of matings; the program will then check the diagnosis.

There is also an EXPERIMENT mode in which the student can define the characteristics of the sample.

GENIE may be used by itself or with MENDELIAN GENETICS: A Problem-Solving Approach. A Study Guide to GENIE is included in the text.

AP-5 APPLEPACK includes:

Text: **MENDELIAN GENETICS**	270pp.	5½" x 8½"	$ 6.95
Package: "GENIE" Diskette	Student manual		$60.00

Table of Contents

Introduction: To the Student
Section A: Dominance and Recessiveness
Section B: Partial Dominance
Section C: Lethality
Section D: The Physical Mechanism of Inheritance
Section E: Multiple Alleles in a Population
Section F: Sex Linkage
Section G: Multi-trait Inheritance
Section H: Linkage of Traits
Section I: Crossing Over and Mapping of Genes
Epilogue: The Complexity of Inheritance in Nature
Appendix: Student Guide to GENIE
Answer Section

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POPULATION GROWTH
A Problem Solving Approach

By: Darlene Southworth
Thomas Mercer Hursh

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POPGROW: A Computer Simulated Laboratory

POPGROW is an interactive computer-simulated laboratory in population growth written in BASIC. It is based on a simple algebraic model of population growth which is ideal for the instruction of beginning students of biology, ecology, and related fields such as wildlife management. The approach is particularly appropriate for those who will go on to practical problems and computer modeling. The program is used in a sequence of 4 units - exponential growth, density-dependent growth, variations in carrying capacity, and delays in regulatory response. While the model is simple, easy to manipulate, and closely tied to underlying biology, the patterns of growth which can be simulated are quite complex. The program is designed to encourage systematic exploration of each biological factor.

POPGROW may be used by itself or with **POPULATION GROWTH: A Problem-Solving Approach**. A Student Guide to **POPGROW** is included in the text.

The Program:

POPGROW: *This program provides an experimental laboratory on population growth.*
In Unit 1, Exponential Growth, you may set the intrinsic growth rate (R), the total time to be shown in the plot (G), the interval at which the population size will be plotted (I) and the starting size of the population (N).
In Unit 2, Density-Dependent Growth, you may set the carrying capacity (K).
In Unit 3, Variations in Carrying Capacity, you may also set the frequency (F) and the percent variability (V) of the carrying capacity.
In Unit 4, Delays in Regulatory Responses, you may also set the size of the delay (D).

POPULATION GROWTH

Table of Contents

Introduction: To the Student
Section A: Population Growth
Section B: Density and Population Growth
Section C: Fluctuating Population Growth
Section D: Delayed Responses to Change in Regulating Factors

Section E: Emigration and Immigration
Section F: Age Structure and Survivorship
Epilogue: Additional Aspects of Population Growth
Appendix: Student Guide to POPGROW
Answer Section

AP-4 APPLEPACK includes:

Text: **POPULATION GROWTH**	Approx. 150pp.	5½" x 8½"	$ 6.95
Package: 'POPGROW' Diskette	Student manual		$60.00

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ELEMENTARY NUMERICAL TECHNIQUES FOR ORDINARY DIFFERENTIAL EQUATIONS

John L. Van Iwaarden
Hope College

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This manual is intended for a post-calculus differential equations course. The student must be familiar with the techniques of integration usually covered in a first course in calculus. The most frequently used techniques require the utilization of the standard formulas for trigonometric and exponential functions and their inverses, integration by trigonometric substitutions, integration by parts, and integration by partial fractions decomposition. The student must also be aquainted with the definition of a power series, its interval of convergence, and some of the more common tests for convergence. Also the calculus operations on series should be familiar.

This manual is constructed to complement a standard textbook by having the student study the numerical techniques immediately after having covered the corresponding material in the text. It is an attempt to instill a recognition of the power of numerical methods, and show a basic plan for attacking a nonstandard problem. As differential equations are encountered in "real-life" applications problems, they very seldom are one of the types found in existing textbooks for which a straightforward analytical method produces the solution. Most equations are non-linear, non-homogeneous, with non-constant coefficients, and hence non-solvable by analytical methods.

The Programs:

BESSLO - *This is a single purpose program which will calculate and print values of the two solutions to BESSEL's equation of order zero.*

BESSL1 - *This is a single purpose program which will calculate and print values of the two solutions to BESSEL's equation of order one.*

EULER - *This program uses Euler's method to find an approximate solution to a first order initial value problem:* $Y'=F(X,Y), Y(XO)=YO$.

EULSYS - *This program uses Euler's method to solve a system of two first order differential equations with initial conditions:* $Y'=F(X,Y,Z), Z^1=G(X,Y,Z), Y(XO)=YO, Z(XO)=ZO$.

HAMMING - *This program uses Hamming's method to approximate the solution of a first order initial value problem:* $Y'=F(X,Y), Y(XO)=YO$.

IMEUL - *This program uses the improved Euler technique to approximate a solution to a first order initial value problem:* $Y'=F(X,Y), \ Y(XO)=YO$.

IMEUL2 - *This program uses the improved Euler technique to approximate a solution to a second order differential equation with initial conditions:* $Y''=F(X,Y,Y'), Y(XO)=YO, Y'(XO)=VO$.

IMEUL3 - *This program uses the improved Euler technique to approximate a solution to the third order differential equation with initial conditions:*
$Y'''=F(X,Y,Y',Y''), Y(XO)=YO, Y'(XO)=VO, Y''(XO)=WO$.

MILNE - *This program uses Milne's fourth order method for approximating the solution of a first order initial value problem:* $Y'=F(X,Y), \ Y(XO)=YO$.

MLNS2 - *This program uses Milne's method to solve a system of two first order differential equations with initial conditions:* $Y'=F(X,Y,Z), Z'=G(X,Y,Z), Y(XO)=YO, Z(XO)=ZO$.

RKU4S - *This program uses the fourth order Runge-Kutta method to solve a system of two first order differential equations with initial conditions:* $Y'=F(X,Y,Z), Z'=G(X,Y,Z), Y(XO)=YO, Z(XO)=ZO$.

RUKU3 - *This program uses the third order Runge-Kutta method for approximating a solution to a first order initial value problem:* $Y'=F(X,Y), Y(XO)=YO$.

RUKU4 - *This program uses the fourth order Runge-Kutta method for approximating a solution to a first order initial value problem:* $Y'=F(X,Y), Y(XO)=YO$.

SERSING - *This program computes values of the two linearly independent solutions of a second order initial value problem at the regular singular point* $X=O$ *using the power series technique. It is designed to be used with recurrence formulas whose series coefficient subscripts differ by one.*

SERSO. - *This program computes values of the solution to a second order initial value problem at the ordinary point* $X=O$ *using the power series technique.*

SERSO3 - *This program computes values of the solution to a second order initial value problem at the ordinary point* $X=0$*, using the power series technique. It is designed to be used with recurrence formulas with series coefficients whose subscripts differ by three.*

YACTUL - *For purposes of comparing the accuracy of an approximate solution to a differential equation with its analytical solution, this program prints a list of actual X and Y values to compare with the approximations.*

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Chapter 1 - An Introduction to Numerical Methods
Euler's Method
The Improved Euler Method

Chapter 2 - Numerical Solution of the Second Order Equation
Euler's Method for Second Order Equations
The Improved Euler Scheme

Chapter 3 - Higher Order Methods
Runge-Kutta Methods
Predictor-Corrector Methods
Comparisons

Chapter 4 - Numerical Methods in Series Solutions
Bessel's Equation
Series Solution at an Ordinary Point
Series Solution at a Regular Singular Point

Chapter 5 - Numerical Methods for Systems
Euler's Method
A Fourth Order Runge-Kutta Method
Milne's Method
Hamming's Method

Problems and Applications Problems follow each chapter.

AP-3 APPLEPACK includes:

Text: **ELEMENTARY NUMERICAL TECHNIQUES FOR ORDINARY DIFFERENTIAL EQUATIONS**

Student Manual:	207pp.	5½" x 8½"	$ 7.95
Instructor's Manual:		5½" x 8½"	1.00
Package: Student manual, instructor's manual, diskette			$65.00

A COMPUTER LABORATORY MANUAL FOR NUMBER THEORY

Donald G. Malm
Department of Mathematics
Oakland University
Rochester, Michigan

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Teach number theory as an experimental science, and encourage your students to discover important facts about number theory by means of experiment and inference or induction.

The advantages of such an approach are manifold. The students gain experience at solving problems in mathematics, and learn techniques of approaching problems which should be useful to them in other branches of mathematics. They see the interplay between intuition, experiment, and logical proof. They learn material of a rather concrete nature which will be useful later in their study of abstract algebra.

Through computer experimentation, the undergraduate student is enabled to experience research, or at least something very close to it. The student gathers data and studies a problem on his own, and makes decisions as to what to do next. He makes guesses and tries to observe patterns. The first programming assignments are designed so that they can be done by beginning programmers, however, the manual is not designed to teach BASIC or any other language.

The instructor's manual contains forty-one experiments, an explanation of each experiment, including a program to do the experiment, and a run of the program. Extensive supplementary notes are included for each chapter in the student manual.

AP-2 APPLEPACK includes:

Text: **A COMPUTER LABORATORY MANUAL FOR NUMBER THEORY**			
Instructor's Manual:	455pp.	5½" x 8½"	$12.00
Student Manual:	256pp.	5½" x 8½"	$ 9.95
Package: Student manual, instructor's manual, 3 diskettes			$95.00

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- Chapter 1 - Unique Factorization and the Euclidean Algorithm
    - The Euclidean Algorithm
    - Modified Euclidean Algorithm
    - Remarks
- Chapter 2 - Congruence
    - Linear Congruences
    - Chinese Remainder Theorem
    - Some Arithmetic Functions
    - Primitive Roots
    - Word Problems
    - Remarks
- Chapter 3 - Linear Diophantine Equations
    - The Equation $ax+by=c$
    - Positive Solutions for $ax+by=c$
    - Equations with More Than Two Variables
    - Systems of Simultaneous Linear Diophantine Equations
    - Another Algorithm
    - Algorithm for Systems
- Chapter 4 - The Distribution of Primes
- Chapter 5 - Quadratic Congruences
    - The Congruence $X^2 \equiv a(\mathrm{mod}\ p)$
    - The Distribution of Quadratic Residues
    - Remarks
- Chapter 6 - Continued Fractions
    - Infinite Simple Continued Fractions
    - A Geometric Description of the Continued Fraction Algorithm
    - Convergence of the Continued Fraction
    - Approximation of Irrational Numbers by Continued Fractions
    - Continued Fractions and Quadratic Irrationals
- Chapter 7 - Diophantine Equations
    - The Pythagorean Equation
    - The Fermat Equation
    - The Equation $x^3 - y^2 = k$
- Chapter 8 - Representations as Sums of Squares, etc.
    - Euler's Method of Factoring
    - Representations as Sums of Three and Four Squares
    - Concluding Remarks

Chapter 9 - Partitions
- The Conjugate of a Partition
- Generating Functions

Chapter 10 - Magic Squares
- Magic Squares of Odd Order
- Magic Squares of Even Order
- Latin Squares

NUCLEIC ACID CONNECTION

This APPLEPACK is intended for use in courses in Introductory Biology, Cell Biology, Molecular Biology, Evolution, Genetics, Human Reproduction, Environmental Studies.

It explores the nature of nucleic acid bases, their function, and cause and effect of mutations. Nucleic acids play many roles in cells. they encode genetic information, carry that information to the locus of protein synthesis, and form parts of important metabolic coenzymes.

The Nucleic Acid connection runs from generation to generation through the genes and from nucleus to cytoplasm in messenger RNA. Sometimes called 'The Central Dogma', it conveys information from DNA thorugh RNA to proteins. On occasion it reverses, making DNA from RNA, but only in virally infected cells. This model creates an allele, that is it makes the two DNA strands that hold genetic information, it transcribes a messenger RNA molecule and translates that message into a polypeptide.

You can view COLOR diagrams of the principal nucleic acid base:

A,Adenine; C,Cytosine; G,Guanine; T,Thymine; and in RNA, U,Uracil.

An animated, COLOR diagram illustrates the synthesis of the three different kinds of Ribonucleic Acid (RNA) in different parts of the nucleus, their independent transfer to the cytoplasm and their final association as a Polyribosome: the protein factory. Several transfer (T) RNA molecules (there is at least one for each of the 20 different amino acids) migrate into the cytoplasm. Then a single message (M) moves out, followed by several Ribosomal (R) RNA molecules. The RNAs then take their characteristic shapes, move into association and make proteins.

After creating the allele you can mutate it, using one of a number of chemical and physical mutagens.

1. Background
2. 2-Amino Purine
3. 5-Bromouracil
4. Hydroxylamine
5. Na Bisulfite
6. Alkyl Sulfonates
7. Nitrosoguanidine
8. Acridines
9. Nitrous Oxide
10. UV Radiation
11. X Radiation

The Program

NUCLEIC ACID CONNECTION: *illustrates the transcription and translation of DNA in chromosomes into mRNA and polypeptides. Eleven mutagens may be used to alter the nucleic acid base. The program may be used to see outline drawings of the principal nucleic acid bases.*

B-7 APPLEPACK includes: DISKETTE
Student pamphlet
$60.00

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GROWTH

Teach growth in populations and organisms using computer models to encourage your students to discover important facts about the relation between environment and size change in populations or organs. The model's graphics illustrate differences between logarithmic and arithmetic solutions.

This material is intended for use in Introductory Biology and Ecology courses in High School and College, in Environmental Studies, Economics, and any other course that studies population growth.

Populations share properties with other biological systems, made up as complex collections of similar components. They change in both size and structure when faced with external pressures and internal mutation. In most real cases, the nature of a population's response can itself change with the changes that occur in its environment.

Growth in both population and organisms can be seen easily in computer models. The models keep track of changes in sizes of populations or structures, displaying these changes generation by generation, or year by year, as appropriate.

Population size changes depend on the environment, whose carrying capacity controls absolute size. The rate of change may either be constant or itself depend on the environment.

You can use these programs to model size changes in a population under differing conditions:

1. Unlimited carrying capacity;
2. Limited, fixed carrying capacity;
3. Randomly changing carrying capacity;
4. Carrying capacity subject to reduction by increased population;
5. Randomly and systematically changing carrying capacity; and
6. Population dependent growth rate.

Populations change between generations by increments. There continues to be a disagreement as to whether population size increase arithmetically or exponentially. You can see the difference between arithmetic growth (growth by difference) and exponential growth every time you run the model. COLOR graphs help the student grasp the relationships of abstract ideas.

The Programs:

POPULATION SIZES - *simulates a dynamic population - Growth can occur in a population under a variety of conditions. You can test the conditions, using either difference or differential solutions to the basic algorithm for increase in population size. Whichever you choose, the graph for both solutions will appear.*

ALLOMETRY - *calculates changes in body shape that occur as organisms age. Organ growth depends on the internal environment of the organism. Differences in growth rates between organs are called allometries. This program shows size changes in organs,* *illustrating allometric growth by the formula:*

$y = b \bullet x^a$

b: the correlation between growth in the organ, and

a: the allometric constant, i.e. the differential growth rate.

The model permits comparisons between up to five different organs and allows users to see results of external pressures and internal mutations.

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Student pamphlet
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APPLEPACKS from COMPress
Price list & Order Sheet

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B-3*	BIOBITS III: GROWTH by T.B. Roos	50.00		
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	Student Manual: 256pp. 5½" x 8½"	9.95		
	Instructor's Manual: 455pp. 5½" x 8½"	12.00		
	Package: Student manual, instructor's manual, 3 diskettes	95.00		
AP-3	ELEMENTARY NUMERICAL TECHNIQUES FOR ORDINARY DIFFERENTIAL EQUATIONS by John L. Van Iwaarden			
	Text: Paperback			
	Student Manual: 207pp. 5½" x 8½"	7.95		
	Instructor's Manual: 35pp. 5½" x 8½"	1.00		
	Package: Student manual, instructor's manual, diskette	65.00		
AP-4	POPULATION GROWTH by Darlene Southworth and Thomas Mercer Hursh			
	Text: Paperback - 150pp. 5½" x 8½"	6.95		
	Package: Student manual & diskette	60.00		
AP-5	MENDELIAN GENETICS by Ruth C. VonBlum, Thomas Mercer Hursh & Donald C. Gillis			
	Text: Paperback - 270pp. 5½" x 8½"	6.95		
	Package: Student manual & diskette	60.00		

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AP-6	INTRODUCTION TO PSYCHOLOGICAL STATISTICS by Janet Price			
	Text: Paperback - 345pp. 5½" x 8½"	9.95		
	Instructor's manual: 82pp. 5½" x 8½"	2.00		
	Package: Student manual, instructor's manual & diskette	60.00		
AP-7	DESCRIPTIVE STATISTICS by Harrison D. Weed, Jr.			
	Text: Paperback - 58pp. 5½" x 8½"	5.95		
	Package: Student manual & diskette	60.00		
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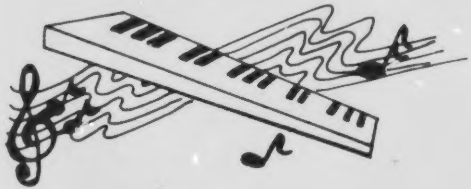

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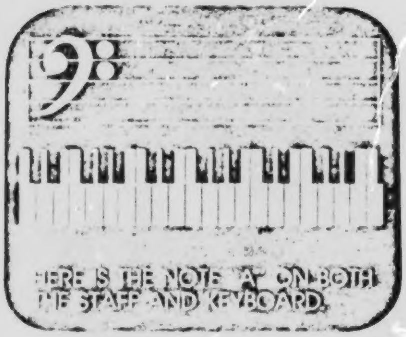

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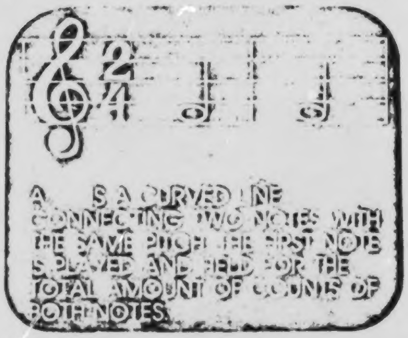

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This manual was written to use with the "SPELLING TEACHER" program. The "SPELLING TEACHER" is an educational program designed to help children have fun while learning how to spell. Some of the many advantages in using the "SPELLING TEACHER" are listed below:

A) Uses graphic as well as vocal reinforcement in teaching the words. It has three different graphic choices.

B) The program is menu-driven with single-key menu selections. Prompts are issed when line input is required.

C) Teachers may use this program with SEVERAL classes (25 students per class). The teacher sets up the lessons, tests, and pronunciations for the program.

D) It does the objective analysis of grading for the teacher.

E) Password protection prevents unauthorized access to both the student's and the teacher's files.

To use this program you will need the diskette containing the "SPELLING TEACHER" program, an APPLE II or an APPLE II PLUS with 48K of memory, a video monitor, a MOUNTAIN HARDWARE "SUPERTALKER" and at least one disk drive.

You should have on hand a copy of the DOS manual (Disk Operating System Instructional and Reference Manual) and The APPLESOFT TUTORIAL. Be sure to read the manuals carefully and understand the operating procedures before starting this or any other program.

PERSONAL COMPUTERS: AN APPROACH TO LEARNING

Reviewed and Tested Materials from CONDUIT

CONDUIT distributes computer-based materials that are reviewed, well-documented, programmed for ease of transfer, and kept up to date. All of the instructional materials are peer reviewed for conceptual validity, instructional usefulness, and overall quality. Series editors in each of our disciplines coordinate the reviews and advise CONDUIT concerning the educational elements of each package. The CONDUIT staff also technically reviews each program for accuracy and transferability to a wide range of computing systems. Materials are currently available for use in teaching biology, chemistry, economics, education, geography, humanities, management science, mathematics, physics, political science, psychology, sociology, and statistics.

The packages currently available from CONDUIT in microcomputer versions are briefly described below. For more information concerning these materials, and other CONDUIT materials in standard BASIC and FORTRAN, return the information card on the last page of this brochure.

Available for PET, Apple, and TRS-80

EVOLUT - Evolution and Natural Selection (#BIO082)

EVOLUT is the Pea Model programmed for the computer. Students can vary the type of selection (against one homozygote, both homozygotes, the heterozygotes), the degree of selection, and the size and composition of the initial population, and then follow the course of natural selection for as many generations as desired. Package includes six copies of Students' Notes, one copy of Teachers' Guide, and software on diskette or cassette ($35.00). Add'l Students' Notes, $1.50; Add'l Teachers' Guide, $1.50; Add'l Micro Media, $10.00.

Ecological Modeling (#BIO083)

This package of eight programs introduces students to techniques for modeling ecological systems and processes. Students experientially test hypotheses and predict results from ecosystems by controlling initial population size, growth rate, time length of the simulation, and other parameters. Package includes three copies of User's Manual and software on diskette or cassette ($65.00). Add'l User's Manual, $4.00; Add'l Micro Media, $10.00.

COEXIST - Population Dynamics (#BIO118)

COEXIST provides students with the facility to study population dynamics by simulating biological situations. By controlling the number of offspring, generation times, initial and saturation points, and inhibiting factors, students should learn about their influence on single-species populations and competition among species. Package includes six copies of Students' Notes, one copy of Teachers' Guide, and software on diskette or cassette ($35.00). Add'l Students' Notes, $1.50; Add'l Teachers' Guide, $1.50; Add'l Micro Media, $10.00.

LINKOVER - Genetic Mapping (#BIO122)

This unit allows students to plan and execute a program of experiments to draw a genetic map of a single chromosome. The student specifies a series of genetic crosses and from the resulting data builds up a linkage map for ten genes of a hypothetical diploid species using the three-point testcross technique. Package includes six copies of Students' Notes, one copy of Teachers' Guide, and software on diskette or cassette ($35.00). Add'l Students' Notes, $1.50; Add'l Teachers' Guide, $1.50; Add'l Micro Media, $10.00.

ENZKIN - Enzyme Kinetics (#BIO181)

This unit permits students to obtain realistic results rapidly using the computer program to simulate enzyme-catalyzed reactions. Six enzymes are simulated by the program for students to study. Package includes six copies of Students' Notes, one copy of Teachers' Guide, and software on diskette or cassette ($35.00). Add'l Students' Notes, $1.50; Add'l Teachers' Guide, $1.50; Add'l Micro Media, $10.00.

COMPETE - Plant Competition (#BIO182)

This unit of seven investigations concerning interactions between flowering plants is designed around real experiments, simulated experiments, and second-hand data in the form of graphs and tables. The computer simulation allows students to plan and carry out investigations without the long delay usually associated with growth experiments. Package includes six copies of Students' Notes, one copy of Teachers' Guide, and software on diskette or cassette ($35.00). Add'l Students' Notes, $1.50; Add'l Teachers' Guide, $1.50; Add'l Micro Media, $10.00.

RKINET - Reaction Kinetics (#CHM160)

This unit makes use of a computer program in which a mathematical model represents the ways in which various factors influence the rate of a chemical reaction. The model, based on data from real experiments, will broaden students' knowledge of first- and second-order reactions, rate constants, concentration, and the effect of temperature variation on reaction rate. Package includes six copies of Students' Notes, one copy of Teachers' Guide, and software on diskette or cassette ($35.00). Add'l Students' Notes, $1.50; Add'l Teachers' Guide, $1.50; Add'l Micro Media, $10.00.

HABER - Ammonia Synthesis (#CHM199)

This computer simulation provides students with the opportunity to study the Haber process and how the various conditions (temperature, pressure, catalyst, and reactant concentration ratios) influence the course of the reaction (i.e., the time required to reach equilibrium yield of ammonia). Package includes six copies of Students' Notes, one copy of Teachers' Guide, and software on diskette or cassette ($35.00). Add'l Students' Notes, $1.50; Add'l Teachers' Guide, $1.50; Add'l Micro Media, $10.00.

INTERP - Wave Superposition (#PHY183)

This unit on wave superposition is designed to improve students' understanding of the use of models in physics. The unit is built around the wave theory of light and shows students how effective the theory is in explaining observed phenomena. Package includes six copies of Students' Notes, one copy of Teachers' Guide, and software on diskette or cassette ($35.00). Add'l Students' Notes, $1.50; Add'l Teachers' Guide, $1.50; Add'l Micro Media, $10.00.

SCATTER - Particle Scattering (#PHY129)

Because of the experimental difficulties in performing certain nuclear scattering investigations, models of three experimental situations have been programmed for computer simulation. The programs give students experience in deducing the size, shape, and force law of a single scattering center, and the scattering of alpha particles by a metal foil. Package includes six copies of Students' Notes, one copy of Teachers' Guide, and software on diskette or cassette ($35.00). Add'l Students' Notes, $1.50; Add'l Teachers' Guide, $1.50; Add'l Micro Media, $10.00.

NEWTON - Satellite Orbits (#PHY130)

Using this program to simulate Newton's experiments, students are able to investigate Newton's Law of Gravitation and Second Law of Motion, and the relationship between these models. Package includes six copies of Students' Notes, one copy of Teachers' Guide, and software on diskette or cassette ($35.00). Add'l Students' Notes, $1.50; Add'l Teachers' Guide, $1.50; Add'l Micro Media, $10.00.

Available for Apple and TRS-80

Laboratory in Cognition and Perception (#PSY224)

This computer-based system provides a viable alternative to traditional laboratory courses by exposing students to a variety of phenomena, theoretical points of view, techniques, and experimental designs. Six experiments covering the human information processing system are included. Package includes five copies of Student Guide, one copy of Instructor's Guide, and software on diskette for Apple or TRS-80 ($110.00). Add'l Student Guide, $5.00; Add'l Instructor's Guide, $8.00; Add'l Micro Media, $10.00.

Available for Apple

Group Velocity (#PHY280)

In this program for the Apple II students use game paddles to control wave velocity and wave length to demonstrate a traveling sine wave and two types of wave groups by controlling wave velocity and group velocity. Students select values for frequency, time, and wave number to display velocity, oscillation, cosine waves, moving waves, and group waves. Package includes one copy of Student Guide and software on diskette for the Apple ($45.00). Add'l Student, $1.50; Add'l Micro Media, $10.00.

Tribbles (#BIO248)

This introductory unit on the scientific method consists of a written tutorial and a computer simulation. The tutorial presents students with a problem and guides them to its solution. The computer simulation provides the data for making observations and for forming tentative explanations and testing predictions. To eliminate the variable of background knowledge, the problem takes place on an alien planet inhabited by tribbles. Package includes five copies of Student Tutorial and software on diskette for the Apple ($35.00). Add'l Student, $2.00; Add'l Micro Media, $10.00.

Practicando Español con La Manzana II (#HUM278)

These computer-assisted instruction materials in Spanish provide: (1) verb drills covering virtually all tenses of Spanish verbs (excluding the perfect subjunctive and the future and conditional perfects); and (2) vocabulary drills which can be keyed to any textbook of the instructor's choice. The drills are appropriate at all levels of Spanish language courses from the seventh grade through second-year college whenever students need drill in vocabulary (English to Spanish) or in verb forms. Students can use the drills as soon as they learn to read and write vocabulary items and verb tenses. Package includes one copy of Instructor's Guide and software on diskette for the Apple II ($100.00). Add'l Instructor, $3.00; Add'l Micro Media, $10.00.

a reviewed and tested package from CONDUIT
Registry #HUM278/Humanities

Practicando Español con La Manzana II

Computer-Assisted Instruction in Spanish

Robert Phillips, Miami (Ohio) University

Although drill is an essential teaching tool in foreign language instruction, it is often difficult to administer. Individualized drill requires an excessive time commitment and is seldom practical (to any great degree) for large classes of beginning Spanish students. Yet the process of writing (or typing the answer at the computer) is helpful to many students and apparently helps fix the item in the student's mind. The need for efficient drill in learning a foreign language is an obvious case for utilizing the computer. As proctor, the computer can efficiently query the student and check the student's typed response, at whatever pace the student sets. The computer is infinitely patient, reliably accurate, and is becoming readily available. Drill and practice on the computer is not full language communication: it does not give students oral practice. But a student who cannot form verbs correctly or who cannot recall vocabulary, cannot communicate.

These materials for the Apple II provide (1) verb drills covering virtually all tenses of Spanish verbs (excluding the perfect subjunctive, and the future and conditional perfects), and (2) vocabulary drills which can be keyed to any textbook of the instructor's choice. The drills are appropriate at all levels of Spanish language courses from the seventh grade through second-year college whenever students need drill in vocabulary (English to Spanish) or in verb forms. Students can use the drills as soon as they learn to read and write vocabulary items and verb tenses.

Overview of the Drills

Four drilling programs are included in the package, three drills on verb forms and one drill on vocabulary items. In all drills, items are presented in random order so that students will not learn the items by position. Once the student has selected a drill, the program presents a stimulus. If the student responds with the correct answer, the program continues with another stimulus. If the student's response is incorrect, the program asks for a second response. If the student's answer is wrong the second time, the program reports the correct answer and asks the student to enter it. The program will not continue until the student has entered the correct answer. Thus, students must participate actively in the drilling process!

When checking the student's incorrect response, the program first looks for an error with an accent mark (and with a tilde in the vocabulary drill). If the accent is in error, the program informs the student of the nature of the error, such as "THE ACCENT MARK IS IN THE WRONG PLACE" or "AN ACCENT MARK IS NEEDED ON THIS WORD." For any other type of error, the program informs the student that the response is wrong but does not diagnose the error.

The student can ask for a hint (by typing HELP) or to see the correct answer (by typing ANSWER). Since the items are chosen at random, the student can choose to stop (by typing STOP) or to change drills (by typing CHANGE) at any time. The student's score of correct and incorrect responses is given at the end of the drill but no record of the score is kept; the score is for the student's information only.

Easy Drill includes 19 different drills on verb forms of specific types, for example, stem-changing present indicative or irregular future. Each drill presents 25 items chosen randomly. When the student correctly responds to an item on the first try, that item is removed from the list. Thus, the items that the student has difficulty with are those which are repeated.

The stimulus for the six drills on present tense indicative and subjunctive is a subject and an infinitive. for the drill on past participle. the stimulus is an infinitive. and for the remaining 12 drills. the stimulus is a verb in the present indicative tense. The student must examine the stimulus verb to determine the subject. Thus. at the same time that students receive active drill in the formation of. say. the preterit tense. they also receive passive review of the present tense.

The hints in *Easy Drill* try to anticipate the errors that students are most likely to make. They remind the student that a form has a stem change or a spelling change. or that it is irregular. Many hints also give the ending. If the hint is still insufficient. the student may ask to see the correct answer. The student may also request a review and the program will print a short summary of how to form that particular tense. as well as any irregularities.

Hard Drill is more difficult than *Easy Drill* since it allows the student to mix tenses and types of verbs. The drill includes 54 verbs divided into four levels of difficulty. The student selects the level of difficulty desired and the program selects verbs from that level and from all lower levels. Students can drill from one to nine tenses: present indicative. imperfect indicative. preterit. future. conditional. present subjunctive. past subjunctive. present perfect indicative. and past perfect indicative. Neither the *vosotros* forms nor the -se forms of the past subjunctive are available.

Hints are more difficult to arrange in this drill since each individual item is not kept in the program. The first hint gives the ending (or the past participle if it is a perfect tense). The second hint gives the stem (or helping verb). By combining these two hints in the proper order, the student can derive the correct answer.

Command Drill includes 50 verbs, divided into four levels of difficulty, for drilling on commands. Three subjects are possible (*Vd, Vds, and tú*). The student selects polite and/or familiar forms, whether to include negative commands, and whether to include object pronouns. The stimulus is a statement. The student must identify the subject and then change the statement to a command using the same subject. For example *No comen* becomes *No coman* and *Me lo dices* becomes *Dímelo*. Pronouns are chosen randomly from appropriate types, for example, certain verbs will have reflexive pronouns, others will not have indirect objects.

When the student requests help, a review of forming commands is presented, appropriate to the verb and subject under consideration. For example, the review may note that a spelling change is required or discuss the placement of object pronouns.

Vocabulary presents an English word or expression and students respond with the Spanish equivalent. The program checks for tildes and accent marks, and alternate answers are acceptable (for example, either *hermoso* or *bonito* would be accepted for "pretty"). As with *Easy Drill*, when a student gets an item correct the first time, the item is removed from the list of available items.

The specific content of this drill is determined by the instructor, thus allowing complete control keyed to the particular text being used.

All of the drills are designed to be as easy for students to use as possible. Neither the student nor the teacher need know anything about computers or programs or files. It is helpful, of course, if the students can type, but even that is not necessary. The diskette containing the programs and files are designed to be completely self-starting and self-prompting, so that the student merely needs to know how to start the computer.

The drills are written for the Apple II and require Applesoft BASIC in ROM, DOS, and 48K memory. The package from CONDUIT includes the programs on diskette (5¼") and an *Instructor's Guide*.

a reviewed and tested package from CONDUIT
Registry #PHY280/Physics

Group Velocity Demonstration Using an Apple II

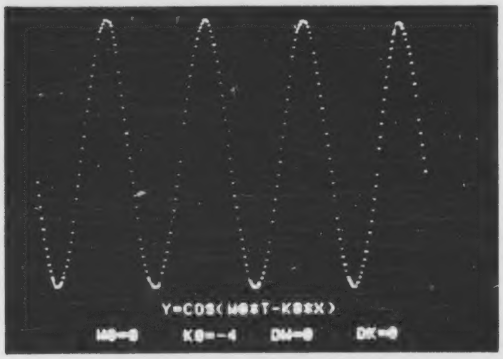
Eric T. Lane
University of Tennessee at Chattanooga

Of the many microcomputer-based units CONDUIT has reviewed, this demonstration of wave phenomena stands out from all others in its effective use of the medium. The program generates striking animated displays of wave motion that capture the user's interest immediately, and provoke a series of "What if?" questions that lead naturally into the exercises presented in the *Student Guide*.

In this package, students study traveling waves of the form

$$y = \cos(wt - kx)$$

where y is the vertical amplitude, w is the angular frequency, t is the time, k is the wave number (the wave length $\lambda = 2\pi/k$), and x is the horizontal position. The high-resolution display of the Apple II allows this traveling wave to be easily displayed (see figure 1). The two game paddles are used to vary the frequency and the wave number over a reasonable range of positive and negative values (-16 to $+16$). The student is reminded how to derive the expression $v = w/k$ for the velocity of the wave, which can be verified experimentally by measuring it directly from the display screen.



```
Y=COS(W0*T-K0*X)
W0=0   K0=-4   DW=0   DK=0
```

FIGURE 1.

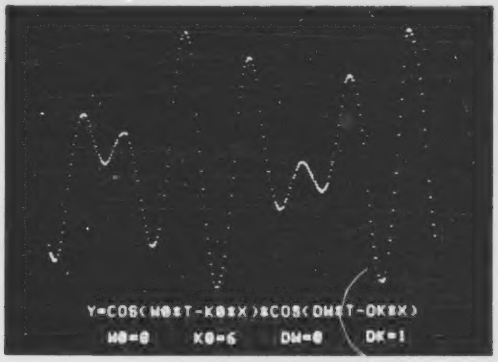
The student begins by observing oscillation alone, that is

$$y = \cos(wt).$$

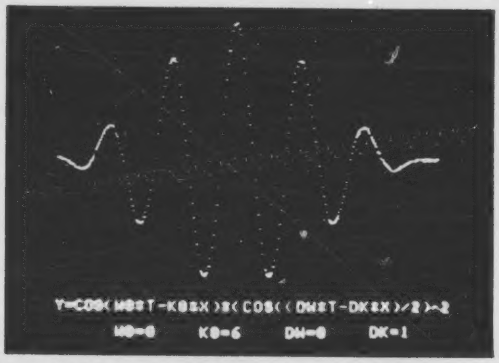
This is arranged by using either the paddles or keyboard input to set $k = 0$ and varying w from -16 to $+16$ to show sinusoidal oscillation.

Next the cosine function $y = \cos(-kx)$ can be observed with various wave numbers, k, by setting $w = 0$, and varying k from $+16$ to -16. The student can then see directly what the wave number represents in terms of the screen image.

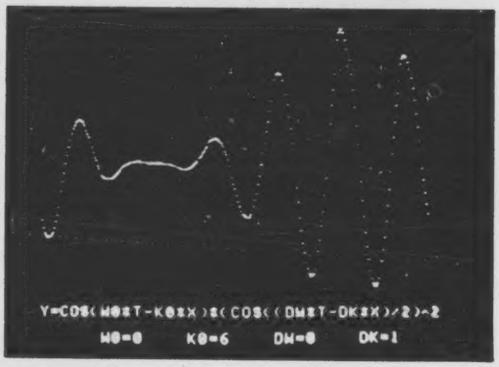
Finally the student can observe moving waves by setting the wave number, $k = 1$, and varying the frequency $w = +16$ to $w = -16$. The relationship of k, w, and wave velocity can be verified experimentally for various values of k and w by measuring the velocity from the display screen.



```
Y=COS(W0*T-K0*X)*COS(DW*T-DK*X)
W0=0   K0=6   DW=0   DK=1
```



```
Y=COS(W0*T-K0*X)*(COS((DW*T-DK*X)/2)^2
     W0=0     K0=6     DW=0     DK=1
```



```
Y=COS(W0*T-K0*X)*(COS((DW*T-DK*X)/2)^2
     W0=0     K0=6     DW=0     DK=1
```

This first exercise allows the student to become familiar with the operation and control of the parameters through the game paddles. Of primary importance is that it lets the student control the variables in the mathematical expression for the wave equation and immediately observe the results.

The relationship of group velocity and phase velocity can be demonstrated by considering the addition of two cosine waves of slightly different frequency and wave number.

$$y = \cos[(w + \Delta w)t + (k + \Delta k)x] + \cos[(w - \Delta w)t + (k - \Delta k)x]$$

which, after a little manipulation can be expressed as

$$y = 2\cos(wt - kx)\cos(\Delta wt - \Delta kx)$$

When this last expression is compared with the original traveling wave equation, it can be seen that it represents the original wave now modulated by an oscillatory envelope given by the delta terms. The wave velocity is still given by $v = w/k$ but now the modulation envelope or group of waves will be found to move with a velocity of

$$u = \Delta w/\Delta k.$$

The *Student Guide* describes in detail how students can use the program to illustrate wave group phenomena and experimentally verify basic relationships. The guide concludes with a discussion of several natural wave phenomena exhibiting group velocity effects, and presents a number of related exercises for the student.

The package from CONDUIT includes one copy of the *Student Guide* and the software on diskette for the Apple II (Applesoft in ROM, DOS, 48K).

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To order a package...

Registry Number	Title	Package (including manuals & sofware)			Add'l Student Manuals		Add'l Instructor Manuals		Add'l Micro Media		TOTAL
		Qty.	Price	Version*	Qty.	Price	Qty.	Price	Qty.	Price	
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BIO082	EVOLUT		$35.00			$1.50		$1.50		$10.00	
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PHY280	Group Velocity		$45.00	Apple		$1.50		N/A		$10.00	
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										TOTAL	

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- ☐ Floppy Disk for PET
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Microcomputer:
Manufacturer/Model:
Operating System/Version:

Each package includes software and at least one copy of each manual. Not all packages are available on micros. Please check catalog description before ordering.

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	Add'l Instructor Manuals					✓			3.00	
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Each package includes software and at least one copy of each manual. Package price includes cost of the distribution media. A listing of the source is always included with each package as well.

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Transfer Medium:

○**Nine Track Magnetic Tape** (no labels, odd parity, fixed length records)

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○6250 bpi

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ASCII parity bit ○even
○odd
○no (always zero)
○mark (always one)
○EBCDIC

blocking ○unblocked (one record per physical tape block)
○blocked, maximum block size
(in characters) ______________
(check unblocked if you are not sure)

○**Punched Cards** (80 column cards)
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○BCD ("026")

○**Flexible Disk** (eight inch, soft sectored, single density, single side)
format ○IBM Basic Data Exchange (EBCDIC code)
○DEC RT-11 (ASCII code)
○CP/M

○**Paper Tape** (ASCII code, trailing blanks trimmed from records)
ASCII parity ○even
○odd
○no (always zero)
○mark (always one)

end of line characters ○CR, LF
○CR, LF, DC3 (DC3 is control S)
○other (please specify) ______________

end of file character ○none
○SUB (also called control Z)
○DC3 (also called control S)
○other (please specify) ______________

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○**Other**

To save confusion and time, it is best to call us before requesting a distribution media or format not mentioned above for transferring standard BASIC or FORTRAN versions of packages (telephone 319 353 5789)

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All other software (standard BASIC and FORTRAN for mainframes) can be ordered directly from CONDUIT.

COOK'S COMPUTER COMPANY
1905 Bailey Drive
Marshalltown, IA 50158
December 29, 1980

TYPING . . . . $14.95 (Applesoft, 32K, disk)

DRILL II . . . $29.95 (Applesoft, 32K, disk)

MC PAINTING . $12.95 (Integer BASIC, 32K, disk)

EZ PILOT . . . $34.95 (Applesoft in ROM, 48K, disk)

TYPING is a series of programs which provide instruction on finger placement and drill for touch typing on the Apple Keyboard. Drills are graduated in difficulty beginning with "home base" Keys and progressing through a planned sequence of words and phrases. A speed test identifies Keys which need more work, as well as indicating over-all speed. The disk includes six programs and 19 text files. Disk and 32K minimum required. (Applesoft)

MC PAINTING provides a rich, new, easy-to-use artistic medium. Developed by Bruce Hicks and Melanie Zibit at the University of Illinois for use in art education, the user makes pictures on a color TV. Many tools and procedures for making and editing pictures are available. Pictures may be saved on disk or cassette. A users manual is included. The program is in Integer BASIC, and will run in 16K. Both disk and cassette versions are available.

DRILL II provides timed drill on basic facts of multiplication, addition, subtraction, and spelling. Records of student progress are maintained on the disk. Research findings were used to design the system for optimal student learning and teacher convenience. The package includes two diskettes and a teacher's manual.

EZ PILOT is designed for easy use by teachers to develop lesson materials. It may also be used with children (third grade and up) as a first programming language to develop computer literacy. All the standard PILOT core instructions have been implemented as well as special high-resolution graphics and sound commands. The system incorporates "Higher Text" by Ron and Darrell Aldrich to provide upper and lower case letters in both regular and large size. A complete manual, five sample lessons, including a tutorial on how to use EZ PILOT, are provided.

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	PILOT, on disk with manual, ...	$25.00
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(all Integer BASIC):

MC PAINTING with manual (indicate disk or cassette)	$12.95

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SPELL-N-TIME: The computer flashes a whole word; the student must type the correctly spelled word. A second chance is given for incorrect responses, but this time the syllables of the word are flashed in sequence (if more than one syllable). After a second incorrect response, the word is retained on the screen and the student must type it correctly before the game will continue. Score is based on time and accuracy.

Presentation-time of words varies depending upon the ability of the user: a series of incorrect responses will cause slower presentation-time, a series of correct responses will cause faster presentation-time. At the end of each game, a list of mis-spelled words will appear on the screen for the student to write on his/her worksheet.

QUIZSTAT:

This program gives the teacher a count of students missing each question on a quiz or test, percent of students missing each question, class average overall, and a grade-percent scale.

Quizzes and tests do not need to be multiple choice, true-false, or machine mark-able.

REVERSE:

The user chooses the number of letters to unscramble (2 to 18). The computer presents a random selection of letters to the user. By reversing leftmost groups of letters, the aim is to get all the letters in alphabetical sequence.

REVERSE works this way. Suppose we are faced with a random selection of four letters (none repeated) like:

S B F X

The goal is to get the X on the right, the B on the left, and all other letters in correct sequence in between.

If we reverse the leftmost two letters, we get:

B S F X

If we had reversed three letters, we would have gotten:

F B S X

then reversing two would have been a winning move:

B F S X

The program shows a timer running on the screen, so students are playing Beat The Clock against themselves.

At the end of each game, the player may use the worksheet in the student's guide to keep track of number of letters used, number of moves needed, and time elapsed.

SAMPLING: The program establishes a population of 100 "scores" between 10 and 27. Random samples of 5 scores are taken from the population, their means calculated and graphed. The experience is designed to be used as part of an introduction to sampling with attention to the relationship between the population mean and the means of samples taken from that population. This is a difficult concept for students at any age. The experience is most effective if each student can run the program and answer a set of worksheets by him or herself.

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Getting Started

The Teacher Plus

The Teacher Plus program allows users of the Apple II computer with Applesoft or the Apple II Plus computer to learn BASIC. The conversational program lets the user learn the language without books or manuals. The 18 lessons enable the user to master commands in Applesoft as well as learn about sound and graphics functions of the Apple 11. Product #MD-035, disk version; Retail, $40.00. Tape version, #MT-035, $35.00.

The Teacher Plus Pac

The Teacher Plus Pac is a combination package designed for the user of the Apple II computer with Applesoft or the Apple II Plus. The program includes "The Teacher Plus" and "The Floating Point Dictionary". The two disk package acquaints the Apple user with the sound and graphics patterns of the machine and teaches Applesoft. Product #MD-040. Retail, $70.00.

Protecting Your Investment

The Apple Doctor

The Apple Doctor program helps you take care of your Apple. When you think your computer has a problem or needs to be serviced, use your Apple Doctor. The system tests all RAM and ROM chips, various peripheral boards, disk drives, tape system, game controls and your video output. Instructions and testing information appear on your screen. Product written for Apple II with Integer Basic on Disk, MJT-1. Retail $50.00.

Tax Planning

The Tax Planning program assists the businessman in estimating taxes. The latest tax rates are used to help you determine capital gains, rents, dividends and other various incomes. The program also assists the individual or accountant in preparing a pro-forma income statement or total tax bill. Product sold for the Apple II with Applesoft. #MD-009. Retail, $90.00. Product on disk.

Calling the Doctor

Medical Office Management

The Medical Office Management System is capable of scheduling up to 19,000 appointments and can keep an active file of 10,000 patients. The system handles up to 190 patients per day for each physician and about 250 transactions.

The billing system allows full reporting of daily transactions, payments by mail, third party payments and preparation of insurance claims. It also bills PAST DUE balances and prepares monthly reports that can be used for collections follow-up.

Appointment cards can also be printed out for future appointments. It is simple to keep all the patients' files up-to-date with this versatile program. Product available for Apple II with Applesoft, 48K, and 130 column printer, MD-020. Retail, $450.00. The handbook is also sold separately at $25.00.

Dental Office Management

. The Dental Office Management System allows the dental office personnel to make appointments, prepare private patient billing, and calculate dental insurance claims. With this system, patient master files, professional fee schedules and third party accounts may be set up.

The special feature of this program is that the system contains an element which the receptionist or secretary can use to remind patients that is is time for a "check-up".

The product is designed for the Apple II with Applesoft and needs 2-3 disk drives and a 130 column printer, MD-042. Retail, $500.00. The handbook may be bought separately for $25.00.

Scheduling Problems?

The Class Scheduling Program

The Class Scheduling Program gives the administrator an opportunity to schedule the students' courses on the screen The system permits the scheduling of required and elective courses as well as setting aside time periods for lunch periods and study halls. The system will handle up to 2,400 students per run and 1,000 courses with up to 16 class selections per student.

The system, for the Apple II with Applesoft, requires 48K and 2 disk drives. Product #MD-039. Retail, $250.00. Handbook may be purchased separately at $25.00.

The Grading System Programs

The Grading Systems Programs III makes the accumulation of grades for report cards and honor rolls a snap. Students' grades, averages, and school credits may be kept on disk for the entire school period. The student registration and class schedule elements are also useful for the entire year.

The system can handle class schedules, rosters, and grade summaries for 600 students per diskette. An unlimited number of diskettes may be used depending on the size of the junior high, high school, or small college.

The system includes the CMA Light Pen and The Electric Gradebook as described elsewhere. The program needs 1 disk drive and an 80 column printer. The product is available on disk for the Apple II with Applesoft, MD-013. Retail, $300. Handbook may be purchased separately for $25.00.

The Counsellor's Program

The Counsellor's Program is designed to work with The Grading Systems Programs. The guidance counsellor can prepare master student records and file folders by using the applications. A semester by semester summary can be kept of each student's classes and grades. Career guidance information can be stored to imply proper courses needed. The product, MD-038, is available on disk for the Apple II with Applesoft. Retail, $90.00.

The Electric Gradebook

The Electric Gradebook helps the teacher with assignments, tests, quizzes and homework. Detailed class records are easily kept for the six weeks' period or quarter with the program.

The product on disk is available for the Apple II with Applesoft, MD-003. Retail, $50.00. The program comes free if you order the complete Grading Systems Programs III.

The CMA Light Pen

The CMA Light Pen is a fast, effective method that the teacher or school office staff may use instead of using the keyboard. The Light Pen doesn't require a free slot and plugs in easily. The Light Pen comes free as part of the Grading Systems Programs III for Apple II with Applesoft. If bought separately, give product # MD-008. Retail, $50.00.

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Making It Easy

Apple Teacher

The "Apple Teacher" is a universal teaching program for the Apple computer. The teacher may develop lessons on the system. The pupil is permitted to select lessons to run. The program also keeps track of the student's progress on each lesson. Product on disk for Apple II computer with Applesoft, #ED-1, Retail, $30.00.

Inventory Pac

The Inventory Pac permits the user to keep account of the store's inventory. A special feature allows one to check stock from different vendors. The second portion of the Pac, an inventory management library, assists in making decisions to buy and in what amounts. Product for Apple II with Applesoft on disk, MD-021. Retail, $90.00.

Payroll

The Payroll I System contains the latest tax tables and Social Security formulas. The stand alone payroll system also allows the bookkeeper to keep accurate accounts of the employee's income tax, disability insurance, union dues and health insurance. It is simple to tabulate the company's payroll with this disk based system. Product designed for the Apple II with Applesoft. #MD-022. Retail, $120.00.

Master Mailing List

The Master Mailing List is designed for the professional office that does heavy mailing. The program can be used for most commercially available labels. Lines are used for 1) Name, 2) Company, 3) Street Address, 4) City, State and Zip, and 5) Various user defined codes. Product designed for Apple II with Applesoft; #MD-041. Retail, $90.00.

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2. CLASS ROSTER
3. STATE REPORT TALLYS
4. SELECTIVE PRINT-OUTS
5. END OF JOB

Menu Items

Special Education File Maintenance

1. Record Additions	(add records)
2. Field Changes	(change a record)
3. Record Inquiry	(displays a record)
4. Record Deletions	(deletes a record)
5. Master File List	(lists all students)
6. End of Job	(return to Master Menu)

Class Roster

It sorts all students by teacher name and prints a list of all students assigned to each teacher.

State Report Tallys

This report provides a listing of the counts of exceptionality by school as well as totals to be entered on the State Report.

Menu Items (continued)

Selective Print-Outs

This report allows the operator to choose any one desired field number and print a list of all the students whose value for that field falls in a selected range.

End of Job

This returns the computer to BASIC.

Fields in Special Education

Record Number
Name
Home Address
Mailing Address
City
State
Zip Code
Parent Name
Home Phone
Teacher Name
NS=Normal School
(school in whose district child lives)
AS=Attended School
GR= Grade
PL= Program Level (A-D)
ECD=Ethnic Code
TCD=Tribal Code
Birth Date
Referal Date
Evaluation Date
A&R Date= Appraisal & Review
Placement Date
Withdrawal Date
Re-evaluation Date

Exceptionalities (What is wrong with child)
- BD = Behavior Disorder
- CD = Communicative Disorder
- G = Gifted
- HI = Hearing Impaired
- LD = Learning Disabled
- EMH= Educable Mentally Handicapped
- TMH= Trainable Mentally Handicapped
- MH = Mentally Handicapped
- PI = Physically Impaired
- VI = Visually Impaired

Supplemental Services (What school is doing for the child)
- ST= Speech Therapy
- PT= Physical therapy
- OT= Occupational Therapy
- WS= Work Study
- BT= Behavioral Therapy
- Title-I Reading
- Title-I Math

DATA PROCESSING CONSULTANTS

2405 SAN PEDRO, N.E.
ALBUQUERQUE, NEW MEXICO 87110
505-884-6042

PRODUCT : IMMUNIZATION PACKAGE

PRODUCT NUMBER : EDIMM.APPLE II

PRODUCT CAPABILITIES

* Retains personal data on each student as well as dates and status for six immunizations in the DPT series, five polio vaccinations, rubiola, rubella, and mumps.

* Automatically calculates date next shot in each series is required.

* Prints a report sorted by grade on the students at each school who have overdue immunizations. The report prints student contact information and indicates which immunizations are overdue and what date they were required.

HARDWARE REQUIREMENTS

APPLE II Plus B/W Monitor (or color) Two 5¼ inch Diskette Drives

132 Column Printer Printer Interface Card

WARRANTY AND UPDATES

Class-I 120-day warranty and updates on application software.

Immunization Package

MASTER MENU

1. IMMUNIZATION FILE MAINTENANCE
2. OVERDUE IMMUNIZATION REPORT
3. END OF JOB

Menu Items

Immunization File Maintenance

1. Record Additions	(add records)
2. Field Changes	(change a field in a record)
3. Record Inquiry	(display a record)
4. Record Deletions	(deletes a record)
5. Master File List	(list all students with respective data)
6. End of Job	(return to Master Menu)

Overdue Immunization Report

This report prints identifying information for each student with one or more overdue immunizations. It also prints the date that each overdue immunization was due.

End of Job

This returns the computer to BASIC.

Immunization Package Data Base

- Name
- Address
- Maining Address
- City
- State
- Zip Code
- Parent Name
- Phone
- School Code
- Doctor Name
- Doctor Phone
- Emergency Name
- Emergency Phone
- Date of Birth
- Date Records Due

Student Data and Dates for the following shots:

- 6 Diptheria-Tetanus
- 5 Polio
- Rubiola
- Rubella
- Mumps

We at Data Processing Consultants appreciate your interest in our Educational Software Packages developed for the APPLE Computer System. Each package comes with complete documentation and operating instructions. They contain a Master Menu and various sub-menus which enable the user to choose between many different options.

Since Data Processing Consultants is a custom software house any changes that need to be made to meet state or local laws in your area can be done for a one-time-only extra charge.

MICROCOMPUTER SOFTWARE PROGRAMS

LANGUAGE ARTS

ENGLISH BASICS

By Dr. Stefan L. Irving and William B. Arnold

The following English skills are reviewed and reinforced with student interaction: NOUNS, PRONOUNS, VERBS, ADJECTIVES, ADVERBS, HOMONYMS, SYNONYMS and ANTONYMS, CONTRACTIONS.

Each program focuses on a SINGLE PROBLEM experienced by students. The programs first display text material and highlight it in examples. The student is then quizzed on the skill presented and "reward" messages are displayed for correct answers. If the student gives an incorrect answer, s/he is encouraged to try again. Finally, if the student keeps giving incorrect responses, the answer is displayed.

Program I — Parts of Speech

CP-20100/DK-20100A NOUNS I and II
CP-20102/DK-20102A PRONOUNS I and II
CP-20104/DK-20104A VERBS I and II
CP-20106/DK-20106A ADJECTIVES I and II
CP-20108/DK-20108A ADVERBS I and II

CP-ENG #1 — Set of 10 CASSETTES *(specify model)*	**$145.00**
DK-ENG #1A — Set of 5 DISKETTES *(specify model)*	**$170.00**
Each unit of 2 CASSETTES *(specify CP # and model)*	**$ 29.95**
Each unit of 1 DISKETTE *(specify DK # and model)*	**$ 34.95**

Program II — Concepts in Language Arts

CP-20110/DK-20110A HOMONYMS I and II
CP-20112/DK-20112A SYNONYMS AND ANTONYMS I and II
CP-20114/DK-20114A CONTRACTIONS I and II

CP-ENG #2 — Set of 6 CASSETTES *(specify model)*	**$85.00**
DK-ENG #2A — Set of 3 DISKETTES *(specify model)*	**$99.95**
Each unit of 2 CASSETTES *(specify CP # and model)*	**$29.95**
Each unit of 1 DISKETTE *(specify DK # and model)*	**$34.95**

CLASSROOM MANAGEMENT

READABILITY INDEX

By Dr. Stefan L. Irving and William B. Arnold

The program enables the user to determine the readability of any text by approximate grade level. Parameters checked in the program are average word length, average sentence length, and calculated estimation of the difficulty of the words. It is particularly useful to the classroom teacher in determining appropriate reading materials for students whose reading level is known.

To determine the readability of any text, you need only to type in three paragraphs. The program then calculates the readability and presents the results.

CP-20160 — 1 CASSETTE *(specify model)*	**$9.95**

GRADE AVERAGES

By Dr. Stefan L. Irving and William B. Arnold

This program is unique in that it enables the teacher to calculate grade averages by using BOTH numeric and letter grades. Numeric and letter grades may be entered together without the necessity of previous conversion. The program furnishes the teacher with a numeric and letter grade average, as well as a complete ranking and summary of each student's grades. The use of plus and minus is acceptable and the program can easily be converted to any standard a school system uses.

CP-20161	— 1 CASSETTE *(specify model)*	**$9.95**
DK-CLASSA	— 1 DISKETTE with 2 programs, Readability Index and Grade Averages *(specify model)*	**$24.90**

SPELLING

SCRAMBLED LETTERS

By Dr. Stefan L. Irving and William B. Arnold

The computer presents spelling words with the letters scrambled. Two students compete to unscramble the letters keying in the correctly spelled word. The computer "rewards" the student who spells the word correctly. At the end of the program, all words are displayed on the screen with the correct spelling. Instructions which describe how teachers may add their own words to the program are included.

CP-20132 — 1 CASSETTE *(specify model)*	**$14.95**

FLASH SPELLING

By Dr. Stefan L. Irving and William B. Arnold

The new spelling words are flashed one-by-one on the screen. The student can attempt typing in the correctly spelled word. A correct response receives a "reward." If the student gives an incorrect response, the same word is flashed again for a longer period of time. Instructions which describe how teachers may add their own words to the program are included.

CP-20133	— 1 CASSETTE *(specify model)*	**$14.95**
Set of 2 Spelling CASSETTES *(specify model)*		**$28.50**
DK-SPELLA	— 1 DISKETTE with 2 spelling programs, Scrambled Letters and Flash Spelling *(specify model)*	**$33.50**

MATHEMATICS

"Marvelous, wide-ranging program"
Creative Computing, September 1980

INTRODUCTION TO MATHEMATICS ON THE COMPUTER

By Harry Finkelstein, M.A., Special Education
and Frank A. Russo, A.A.S., Computer Programming

Math Level 1.5-4.0, Reading Level 2, Slow Learners, LD

This program was designed to help slow learners and learning disabled students increase their mathematical abilities by decreasing the distractibility factor and increasing the students' interest.

This program covers addition, subtraction, multiplication, and division. Each area has six levels of difficulty. The student makes his own choice. Each area has twenty randomly selected problems. If the student gets the problem wrong twice, the computer is programmed to show the same problem as a word problem. This is a self-scoring program.

When the student gets 85% correct the computer will allow the student to go on to the next area. If the area is complete, it will go up to the next level of difficulty.

The only prerequisite for the student is that he must be taught to type in "R U N" and to press the ENTER key. The program runs itself.

CP-20030	— 1 CASSETTE *(specify model)*	**$29.95**

INTRODUCTION TO DECIMALS ON THE COMPUTER

Math Level 2-5, Reading Level 3, Slow Learners, LD

By Harry Finkelstein, M.A., Special Education
and Frank A. Russo, A.A.S., Computer Programming

This program is modeled on INTRODUCTION TO MATHEMATICS ON THE COMPUTER, except that it deals with decimals. It covers addition, subtraction, multiplication and division of decimals. Each area has six levels of difficulty.

CP-20031	— 1 CASSETTE *(specify model)*	**$29.95**
DK-INTROA	— 1 DISKETTE with 2 programs, Introduction to Mathematics and Introduction to Decimals *(specify model)*	**$64.90**

MISSING MATH FACTS

Grades 3-6, Remedial Secondary

By Hobert Williams

MISSING MATH FACTS contains addition, subtraction, multiplication, and division examples on four levels of ascending difficulty. The student chooses the level s/he wishes to work on (Level 1, 2, 3, or 4). Each example is presented with the answer, but missing another component. The student must figure out what the missing number is. Correct answers are "rewarded." If the student is unable to give the correct answer by the third try, the complete problem with the answer is displayed. Students may need paper and pencil to work out the problems, especially at the higher levels.

CP-20020	— 1 CASSETTE *(specify model)*	**$29.95**
DK-20020A	— 1 DISKETTE *(specify model)*	**$34.95**

SOFTWARE PROGRAMS

BASIC MATH COMPETENCY SKILL DRILLS (Jr.-Sr. High)

By Michael P. Conlon, B.S. Math, M.A./L.S., East Meadow Public Schools, East Meadow, N.Y.

These individualized programs will not only enhance your students' basic math skills, but will also be a motivational tool to help teachers generate interest in math for poor, as well as average students.

Because these programs make full use of the computer graphics capability, students find the lessons fun to use. Even reluctant students become eager to begin class.

In each program, the student or teacher can choose from a wide range of types of examples and levels of difficulty so that every program contains several lessons. All the examples given are randomly chosen by the computer, yet all examples are within specific ranges of difficulty.

In programs that involve examples with more than one step (for example, Fractions), the student is guided through each example and can't continue until each step is done correctly.

These programs take the boredom out of math drills! The students enjoy the "rewards," which are bold graphics, given for correct answers. The computer relates to each student by name which personalizes the lessons. Most important — students respond with enthusiasm and LEARN!!

PROGRAMS ON CASSETTES

CP-20040 Addition and Subtraction of Whole Numbers
CP-20041 Multiplication and Division of Whole Numbers
CP-20042 Tables 1-12, Addition, Subtraction, Multiplication, Division
CP-20043 Rounding Off Numbers
CP-20044 Fractions — Addition and Subtraction
CP-20045 Fractions — Multiplication and Division
CP-20046 Decimals — Addition, Subtraction, Multiplication, Division
CP-20047 Graphs and Mean, Median, and Mode

Each CASSETTE *(specify CP # and model)* **$ 15.95**
CP-COMP Complete CASSETTE Series *(specify model)* **$115.00**

PROGRAMS ON DISKETTES

DK-2004041 Addition, Subtraction, Multiplication and Division of Whole Numbers
DK-2004243 Tables 1-12 and Rounding Off Numbers
DK-2004445 Fractions — Addition, Subtraction, Multiplication and Division
DK-2004647 Decimals and Graphs and Mean, Median, and Mode

Each DISKETTE *(specify DK # and model)* **$ 36.90**
DK-COMP Complete DISKETTE SERIES *(specify model)* **$135.00**

GRADE STORAGE DISKETTE

This diskette was specially made to go with all Educational Activities' diskette programs. After students finish working on a particular program, the teacher inserts the GRADE STORAGE DISKETTE and it will record and store the students' scores. This diskette can store scores from MANY Educational Activities' programs simultaneously.

DK-20170A — 1 DISKETTE *(specify model)* **$11.95**

CRYPTO

By Dr. Stefan L. Irving and William B. Arnold

For this challenging game program, your students will have to use their skills of logic to decode CRYPTOGRAMS. By using single letter words, double letters in words, and punctuation as clues they can figure out the meanings of these mysterious sentences. Instructions which describe how teachers may add their own sentences to the program are included.

CP-20150 — 1 CASSETTE *(specify model)* **$11.95**
DK-20150A — 1 DISKETTE *(specify model)* **$15.95**

PLEASE SPECIFY MICROCOMPUTER MODEL WHEN ORDERING

Order from: Van Nostrand Reinhold Ltd., **1410 Birchmount Rd., Scarborough, Ont. M1P 1E7**

Educational Activities, Inc.,
1937 Grand Avenue,
Baldwin, NY 11510,
U.S.A.

COMPUCOURSE T.M.
IMPROVING MEMORY SKILLS

Improving Memory Skills will help you organize your mind and accomplish tasks in half the time. You'll stop going over work two or three times or reading the same report over and over again because you've forgotten something. You'll become more at ease — both socially and at work — because you'll be able to recall people's names, facts about them, details about current events, and highlights of important articles.

In the text, you'll learn how to:
- read effectively and retain more;
- remember what you hear and see;
- use a sensory approach to memory;
- utilize memory aids like Mnemonics and the Key-Word Alphabet;
- put phone numbers on tap for instant recall;
- memorize a speech or presentation in just minutes.

Use Your Microcomputer to Strengthen and Guide Your Memory Power Gains.

The micro-applications accompanying the text give you practice in using the several memory techniques you'll learn in the text. They will help you select the most effective method for you by providing:
- tests of your memory retention rate, and instant plots of retention vs. time;
- computer-administered pretesting, aid in learning each of several memorizing techniques, and computer-based monitoring and post-testing, to determine the best techniques for you;
- computer interplay to develop and improve reading retention, learning of names, and memorization of lists.

Educational Programming Systems
1328 Baur Boulevard
St. Louis, Missouri 63132
314/991-0300

Price: $99.95

jem
research
Joint Educational
Management Research

THE MICROCOMMUNICATOR

Copyright 1980

A set of computer programs which transforms the Apple II* or Apple II Plus* microcomputer into a communications device for the severely physically disabled.

For those among us who cannot speak, write or type, these programs enable them to communicate with us with ease. No expensive peripherals are needed; requires only the microcomputer with single disc drive and monitor.

A single keystroke by finger or mouthstick will display any sentence chosen from 60 or more programmed sentences which can be changed at anytime by the user for individuality.

-----AND-----

Messages of up to 100 words and phrases can be constructed for display or printout (optional) by double keystroke selections of a built-in vocabulary which exceeds 1,600 sentence-building words, phrases suffixes, including the 50 most-used words for EACH letter of the alphabet (fewer for Q, Y & Z), PLUS more than 250 words listed by categories, PLUS a 50-word list of user-changeable words and phrases representing the user's name, address, names of local areas, friends, family, etc.

Attention-catching sounds are produced by a single keystroke.

Excellent learning activity for English language development in children.

Future versions for development will contain foreign language vocabulary and/or will replace mouthstick with a simple on/off button for the more severely disabled.

The set of programs in Applesoft are stored on a single disc with Applesoft.
Disc with Version A contains adult level vocabulary.
Disc with Version C contains children's vocabulary.

The Microcommunicator Disc and a duplicate backup disc
with magnetic and paper documentation..........................$ 39.00
All rights to copy reserved.
Plus handling & shipping... 2.75
California residents add 6% sales tax.
* Indicate desired version.

Available through:
GROVER & ASSOCIATES (415) 479-5906
Creekside Center, Suite D 116
7 Mount Lassen Drive, San Rafael, California 94903

*Apple II and Apple II Plus are trademarks of Apple Computer, Inc.

Grover & Associates

Hartley

Hartley Courseware, Inc. P.O. Box 431 • Dimondale, Michigan 48821 • (616) 942-8987

CASSETTE CONTROL DEVICE

This marvelous electronic device allows your computer to activate a cassette tape recorder. This is invaluable in working with students. Teachers may record words, directions, definitions or any oral presentation they wish on the tape. The tape is then synchronized directly with the presentation on the computer.

Teachers are presently using the CCD for

- presenting directions to students who do not read well.
- presenting the initial sounds of letters to non-readers.
- devoloping listening comprehension skills.
- testing spelling words.
- presenting and defining new vocabulary.
- developing ESL presentations with the oral stimulus presented in the native language of the student and the vidio display presented in English.
- helping students hear and correctly respond to new sounds of vowels and blends.

The CCD is easily installed. Complete directions are included. Courseware listed in this catalog which makes use of the CCD is indicated on the Table of Contents page. Samples of scripts are included with the documentation of all programs which use the CCD.

The CASSETTE CONTROL DEVICE (CCD) may be used with any cassette recorder with a remote control jack.

CCD	$79.95

SPECIAL FEATURES OF HARTLEY COURSEWARE

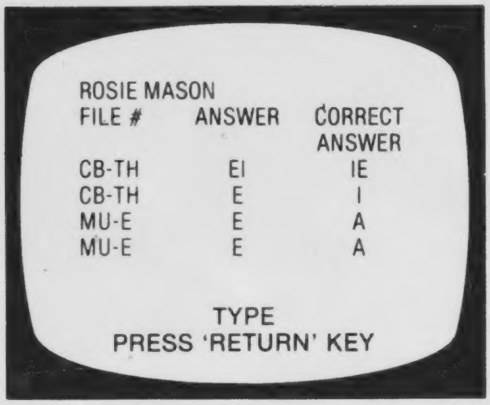
- All Courseware will Boot on 3.2 or 3.3 DOS.
- Courseware allows the teacher to ADD/DELETE files.
- STUDENT PLANNING is available on all student programs. **This is simply the most useful management plan presently available for classroom use!**

  When a student uses a disk, his/her name is entered on the teacher's file. All errors made on every lesson attempted are posted to the teacher's file under that student's name. Listed with each incorrect answer is the correct response. This allows a teacher to immediately see a student's problem area without reference to other files.

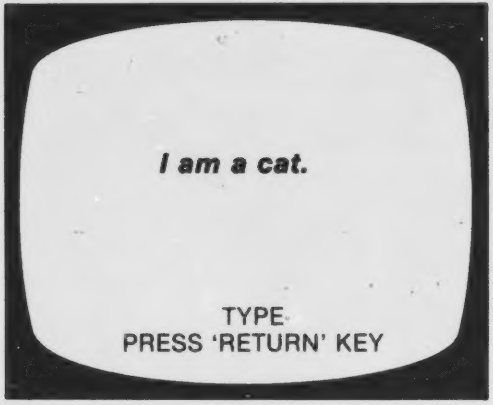
  Each student's records are stored for later review by the teacher. The teacher may display them on the vidio or have them printed out if a printer is available.

  The STUDENT PLANNING file will hold up to 100 students. It may be erased at any time to allow for new records or students.
- Large upper and lower case letters are used for elementary programs.

  All keyboard letters including <, >, and ? are automatically presented to the student in large easy-to-read print.



```
ROSIE MASON
FILE #     ANSWER    CORRECT
                     ANSWER
CB-TH        EI        IE
CB-TH        E         I
MU-E         E         A
MU-E         E         A

            TYPE
    PRESS 'RETURN' KEY
```



I am a cat.

```
            TYPE
    PRESS 'RETURN' KEY
```

All features including ADD/DELETE capability, STUDENT PLANNING, and large upper/lower case letters are available for most of the CREATE programs.

READING-LANGUAGE ARTS

VOWELS

OVER 1000 PRESENTATIONS!

A complete series of lessons on vowels is presented on this disk.

Fifty three lessons of twenty presentations each cover long and short vowels, double vowels, dipthongs, r-controlled vowels, the schwa sound and other related skills.

Instructions and directions are presented on tape with the use of the **CASSETTE CONTROL DEVICE (CCD).**

This is one of the most comprehensive programs on vowels available for the microcomputer.

SPECIAL FEATURES

- Large easy-to-read upper/lower case letters
- **CREATE NEW LISTS** if desired
- Easy directions for recording tapes. These include sample scripts which may be used.
- **STUDENT PLANNING** records student errors on the teacher's file for later review.
- Complete lists of all presentations are given in the documentation.

01-02 . . . . $93.95

CONSONANTS

A complete series of phonics lessons on sounds of consonants and consonant blends is presented on this disk. Initial and final consonants are included along with initial, final and medial blends.

Instructions and directions are presented on the tape recorder with the use of the **CASSETTE CONTROL DEVICE (CCD).**

Ideal to develop listening skills and to help students learn to discriminate between consonant sounds.

SPECIAL FEATURES

- Large easy-to-read upper/lower case letters
- **ADD/DELETE** files as desired
- Easy directions for recording tapes. These include sample scripts which may be used.
- **STUDENT PLANNING** records student errors on the teacher's file for later review.
- Complete lists of all presentations are given in the documentation.

01-03 . . . . $79.95

VOCABULARY-ELEMENTARY

63 lists of up to 40 words each are already programmed into the computer. The words are presented orally by the use of the **CASSETTE CONTROL DEVICE (CCD).** The words are common at the 2-3 grade levels. The lessons closely follow the Harcourt-Brace "Bookmark" reading series.

The student sees the word and says the word. The student then hears the word. The student indicates on the computer if he/she knew the word. The computer stores any errors for future review and teacher planning.

SPECIAL FEATURES

- Large easy-to-read letters
- Easy instructions for making tapes
- Complete lists of all words provided in the documentation.
- **STUDENT PLANNING** stores the difficult words for each student on the teacher's file.

04-01 .... $64.95

VOCABULARY-DOLCH

An excellent way to provide for drill and testing of common words. All Dolch words from pre-reading through the third grade are included on the computer lessons.

The student sees the word and says the word. He then hears the word. The student indicates if he knew the word. The computer stores his responses for future review and planning.

SPECIAL FEATURES

- Large easy-to-read lower case letters
- Easy-to-follow instructions for the making of tapes. Suggested scripts are included in the documentation.
- Complete lists of all words on the files are in the documentation.
- **STUDENT PLANNING** stores the difficult words for each student on the teacher's file.

04-05 .... $39.95

MULTIPLE SKILLS

A variety of lessons covering root words, affixes, homonyms, compound words, plurals and contractions are presented. Lessons include 1-3 level vocabulary. Each lesson indicates the appropriate reading level.

OVER 800 PRESENTATIONS

The instructions are presented to the student on the tape with the use of the **CASSETTE CONTROL DEVICE (CCD).**

The student responds on the computer.

SPECIAL FEATURES

- Large easy-to-read upper/lower case letters
- **ADD/DELETE** files as desired
- Easy directions for recording tapes. These include sample scripts which may be used.
- **STUDENT PLANNING** records student errors on the teacher's file for later review.
- Complete lists of all presentations are given in the documentation.

02-01	$92.95

SPELL IT

This program uses the **CASSETTE CONTROL DEVICE (CCD)** to present spelling or other oral tests to the student.

This program is ideal to use where an oral stimulus and a written response is desired. Any spelling list may be used. **THERE WILL BE NO SPELLING LISTS ON THE DISK WHEN YOU GET IT.** Each word is recorded on tape. The tape is under the control of the computer. The computer keeps track of student responses and provides a printout or listing on the screen for easy grading.

- easy to use!
- helps you individualize your spelling
- helps you give make-up tests without stopping other class work.
- provides additional drill for students who need it.

SPECIAL FEATURES

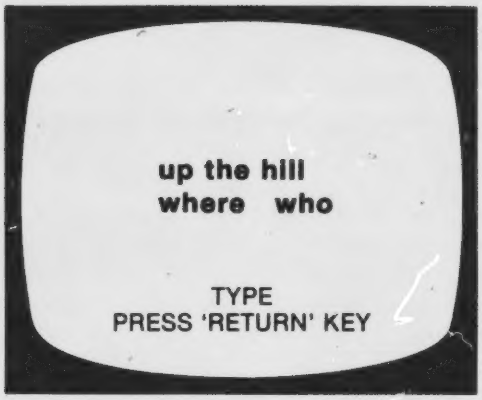
- **STUDENT PLANNING** saves student errors and records them on the teacher's file.
- Storage files can hold up to 100 students. These files may be cleared at any time.
- **ADD/DELETE** may be used on any list.

03-00	$19.95

WHO, WHAT, WHERE, WHEN, WHY

Fourteen lessons have been carefully written and sequenced from easy to difficult. Each lesson contains twenty presentations on combinations of who, what, etc.

Students frequently have difficulty with these easy-to-confuse words and concepts.



```
up the hill
where   who

TYPE
PRESS 'RETURN' KEY
```

SPECIAL FEATURES

- Large easy-to-read letters
- **STUDENT PLANNING** saves the student's errors and records them in the teacher's file.
- **ADD/DELETE** may be used as desired on any file.

07-02 . . . . $35.95

LETTER RECOGNITION

Primary programs at two levels may be selected by the teacher.

kindergarten
first grade

Easy-to-read letters and numerals are presented. The student must find the corresponding letter or numeral on the key board.

The following choices are available:

1. Upper case letters only
2. Lower case letters only
3. Numerals
4. Mixed characters

An excellent 'first' program on the computer for K-1 students!!

SPECIAL FEATURES

- Large easy-to-read numerals and letters
- **STUDENT PLANNING** (for first grade only) stores any errors made by the student in the teacher's file.
- Graphics **fireworks** display for every 10 correct responses

08-02 . . . . $19.95

WORD FAMILIES

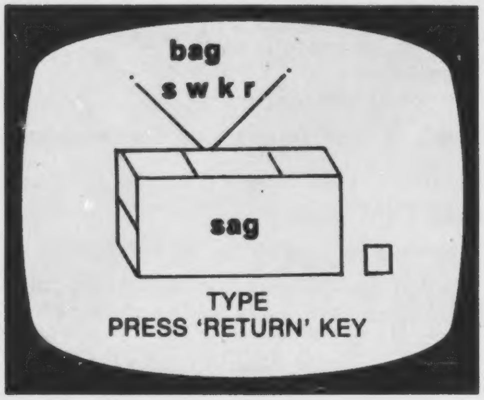
This disk includes three different categories of presentation.

The teacher may select

1. beginning consonant substitution.
2. final consonant substitution.
3. medial vowel substitution.

There are 300 separate presentations.

For each presentation, the word is shown to the student with four additional letters.



The student selects other letters that will make a word. If the student's selection is correct, the letter disappears from the list and the word appears on the screen. If the selection is incorrect, the response is recorded on the student's file. The screen does not change for incorrect responses.

SPECIAL FEATURES

- Large easy-to-read letters
- **STUDENT PLANNING** records errors on the teacher's file for later review.
- Small graphic reinforcer is provided when student successfully completes 5 presentations.
- **ADD/DELETE** files as desired

09-01 . . . . $29.95

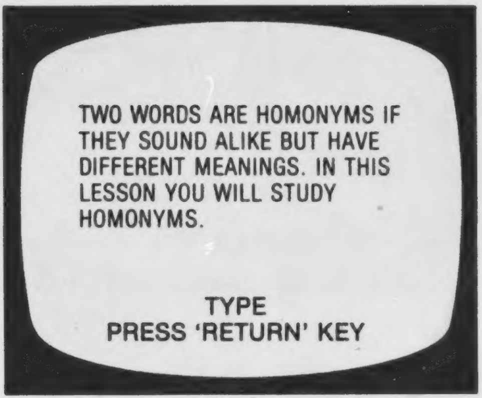
12-05 ROOTS/ AFFIXES

12-06 HOMONYMS

12-07 ANTONYMS/ SYNONYMS

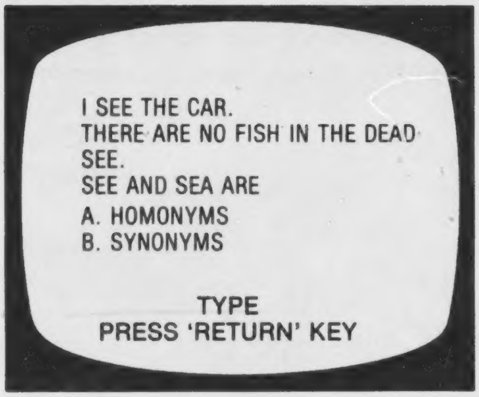
Each disk contains 4 lessons at each of five different reading levels (3-8).

Each lesson contains twenty presentations. Each word is used in at least two different presentations. Each lesson begins with an introductory presentation followed by a simple-to-do example.



TWO WORDS ARE HOMONYMS IF THEY SOUND ALIKE BUT HAVE DIFFERENT MEANINGS. IN THIS LESSON YOU WILL STUDY HOMONYMS.

TYPE
PRESS 'RETURN' KEY



I SEE THE CAR.
THERE ARE NO FISH IN THE DEAD SEE.
SEE AND SEA ARE
A. HOMONYMS
B. SYNONYMS

TYPE
PRESS 'RETURN' KEY

SPECIAL FEATURES

- Regular ALL-CAP letters allow for longer, more comprehensive presentations to be made.
- Introductory presentations are included on all lessons.
- **ADD/DELETE** may be used as desired.
- **STUDENT PLANNING** keeps records of all student errors and posts them to the teacher's file.

12-05	$39.95
12-06	$39.95
12-07	$39.95

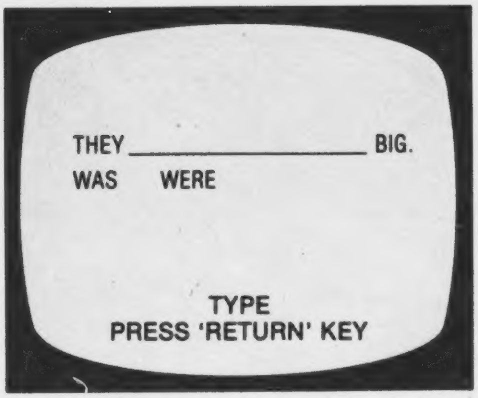
VERBS

This disk contains a comprehensive multi-level program on verbs. This program includes the following categories:

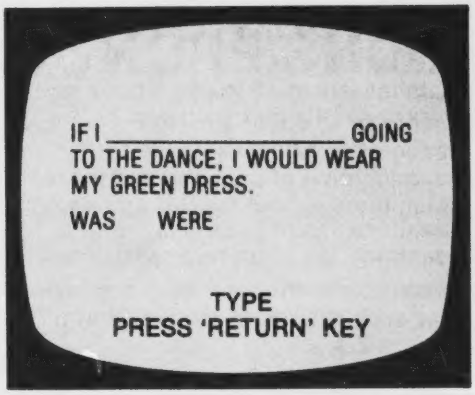
1. recognition and identification of verbs
2. tense of regular and irregular verbs
3. subject-predicate correspondence
4. contractions
5. correct usage

The vocabulary in the lessons is controlled to allow for each skill to be presented at different reading levels.

Each lesson includes an introductory frame followed by a simple example. Difficulty is gradually increased.



```
THEY ____________________ BIG.
WAS     WERE

TYPE
PRESS 'RETURN' KEY
```



```
IF I ______________ GOING
TO THE DANCE, I WOULD WEAR
MY GREEN DRESS.
WAS     WERE

TYPE
PRESS 'RETURN' KEY
```

SPECIAL FEATURES

- **ADD/DELETE** for all files as desired
- **STUDENT PLANNING** posts errors to the teacher's file for later review.
- Regular ALL-CAP letters are used in all programs with the 12- in the identification number. This allows for longer stimulus input.

12-08	$32.95

WORDSEARCH

This program allows a teacher to enter a series of words to create a WORDSEARCH. The Apple II creates the WORDSEARCH to the specifications of the user. This saves hours of work and is simple to use.

The teacher has the option of

—overlapping words, if desired.
—words frontwards, backwards, diagonal.
—words left to right and top to bottom only.

When completed the computer prints the WORDSEARCH. The words are presented at the bottom of the search. The computer will also print an answer key on request. The puzzle may be reprinted as many times as desired or the teacher may wish to use a copy machine and prepare a ditto master.

YOU NEED A PRINTER TO USE THIS PROGRAM EFFECTIVELY.

13-01	$14.95

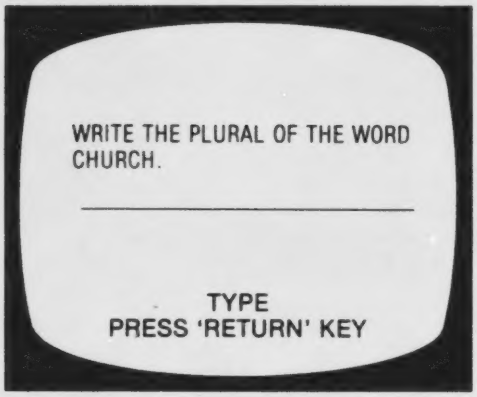
NOUNS/PRONOUNS

A comprehensive multi-level program on nouns and pronouns. This disk includes:

1. recognition of nouns
2. identification of common and proper nouns
3. noun plurals, both regular and irregular
4. identification of pronouns
5. identification of pronoun anticedents

The vocabulary in the lessons is controlled to allow for each skill to be presented at different reading levels.

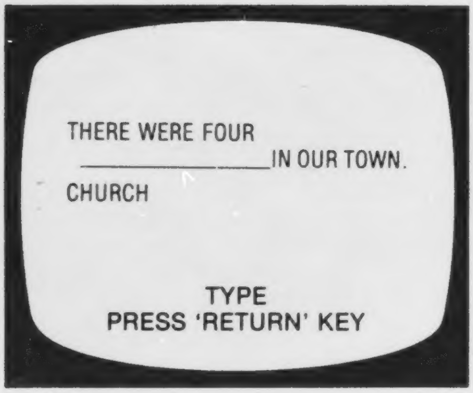
Each lesson includes an introductory frame and simple examples. Difficult words and concepts are presented as least twice in different formats.



WRITE THE PLURAL OF THE WORD CHURCH.

____

TYPE
PRESS 'RETURN' KEY



THERE WERE FOUR ______________ IN OUR TOWN.
CHURCH

TYPE
PRESS 'RETURN' KEY

SPECIAL FEATURES

- **ADD/DELETE** any file as desired
- **STUDENT PLANNING** records student errors on the teacher's file for later review.
- Regular ALL-CAP letters allow for longer stimulus input.

12-09 . . . . $32.95

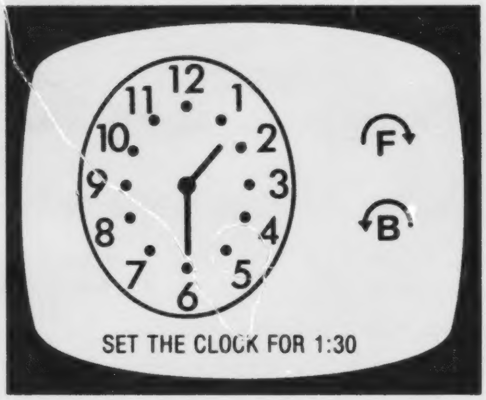
CLOCK

An excellent program to help students learn to tell time. Three separate formats may be chosen by the student (or teacher.)

1. Set the hands of the clock when the time is given digitally.
2. Set the hands of the clock when the time is given in words. e.g. Half-Past seven.
3. Type the digital time when the hands of the clock show the time.

For each format there are five levels of difficulty:

1 — Hour
2 — Half hour
3 — Quarter hour
4 — 5 minutes
5 — 1 minute



SET THE CLOCK FOR 1:30

TYPE
PRESS 'RETURN' KEY

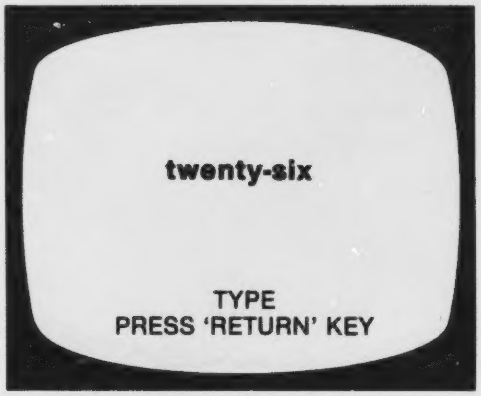
SPECIAL FEATURES

- Easy to read graphics-generated clock
- Hands of the clock are turned by using the 'B' for backward and the 'F' for forward.
- **GRAPHIC REINFORCEMENT** is provided when 10 correct responses are made.
- **STUDENT PLANNING** records all errors made by students on the teacher's file.

01-01 .... $39.95

NUMBER WORDS—LEVEL I

Lessons randomly present thirty number words to students. Two levels are included. One digit or two digit numbers may be selected.



twenty-six

TYPE
PRESS 'RETURN' KEY

SPECIAL FEATURES

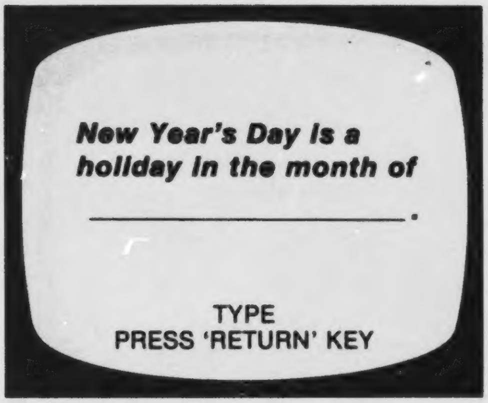
- Large easy-to-read lower case letters
- **STUDENT PLANNING** records student errors on the teacher's file for later review.

08-03 .... $19.95

CALENDAR SKILLS

Lessons include order of days and months; abreviations; seasons, and major holidays.

A total of 10 lessons with 20 presentations each are included on the disk.



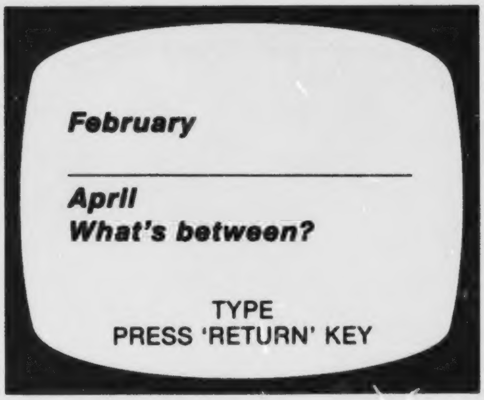
New Year's Day is a holiday in the month of

______________.

TYPE
PRESS 'RETURN' KEY

The student must type the correct answer.

Either January or Jan. is accepted as correct.



February

____

April
What's between?

TYPE
PRESS 'RETURN' KEY

SPECIAL FEATURES

- Large easy-to-read upper/lower case letters
- **ADD/DELETE** all files as desired
- **STUDENT PLANNING** posts errors to the teacher's file for later review.

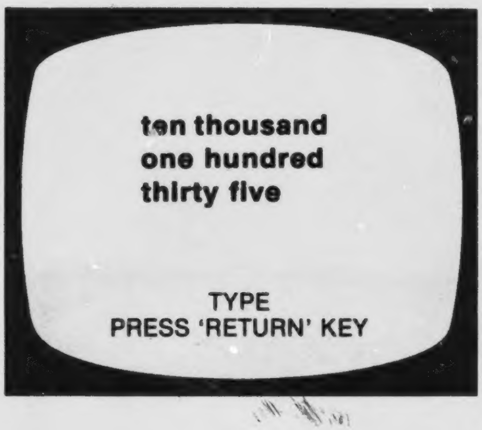
11-02 .... $29.95

NUMBER WORDS— LEVEL II

Ten lessons of twenty presentations each cover number words from one hundred to one million.

Lessons are carefully graduated in difficulty to help the child learn this content area.

Students are presented with the written number.



ten thousand
one hundred
thirty five

TYPE
PRESS 'RETURN' KEY

The student must type the correct number.

SPECIAL FEATURES

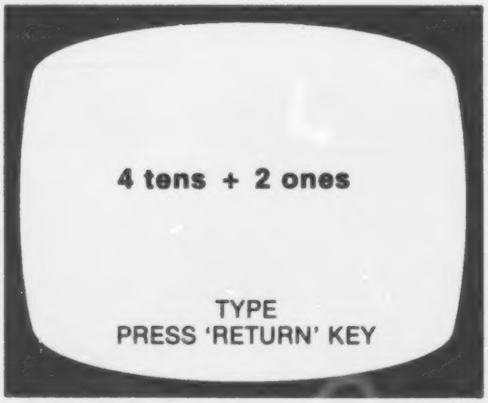
- Large easy-to-read upper/lower case letters
- **ADD/DELETE** any file as desired
- **STUDENT PLANNING** posts errors to the teacher's file for later review.

11-05 .... $29.95

EXPANDED NOTATION

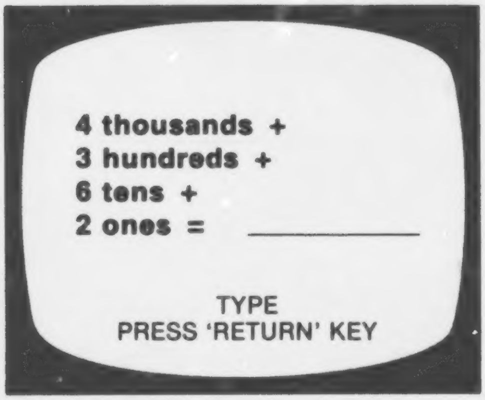
This area is frequently difficult for many students. Now there is enough practice that even students who have great difficulty can master the concepts.

Ten lessons of twenty presentations each may be selected. Skills begin with simple presentations of TENS and ONES. The lessons then build to THOUSANDS, HUNDREDS, TENS, AND ONES.



4 tens + 2 ones

TYPE
PRESS 'RETURN' KEY



4 thousands +
3 hundreds +
6 tens +
2 ones = ____________

TYPE
PRESS 'RETURN' KEY

SPECIAL FEATURES

- Large graphic numbers and letters are used.
- **STUDENT PLANNING** stores a record of student errors for future teacher review.
- **ADD/DELETE** all files as desired

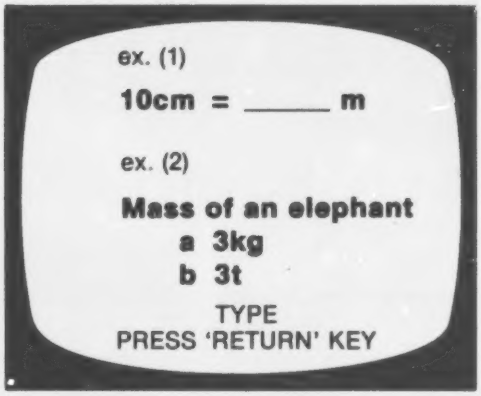
11-06 . . . . $29.95

METRIC DRILL

Lessons are included for the areas of
length
mass
volumn

In each area the teacher may select

1. conversion between metric units at varying levels of difficulty.
2. estimates of the measure of common objects.
3. matching prefixes to their value.
4. matching prefixes and units to the appropriate symbol.



ex. (1)

10cm = ______ m

ex. (2)

Mass of an elephant
a 3kg
b 3t

TYPE
PRESS 'RETURN' KEY

This drill is invaluable for building an experience base with which to better understand the metric units.

OVER FOUR HUNDRED DIFFERENT PRESENTATIONS!

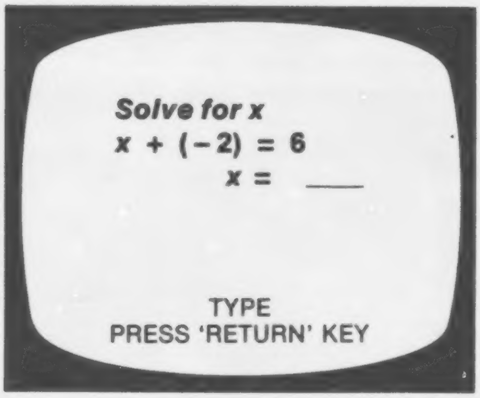
SPECIAL FEATURES

- Large easy-to-read upper/lower case letters
- **ADD/DELETE** for all files as desired
- **STUDENT PLANNING** posts student errors to the teacher's file for later review.

11-07 . . . . $49.95

INTEGERS/ EQUATIONS

Math concepts for the intermediate student Files include drill on the addition, subtraction, division, and multiplication of integers. Students are required to solve simple equations requiring add/sub/mult/div of integers.



Solve for x
$x + (-2) = 6$
$x =$ ____

TYPE
PRESS 'RETURN' KEY

There are 12 lessons on the disk. Each lesson has twenty different presentations.

SPECIAL FEATURES

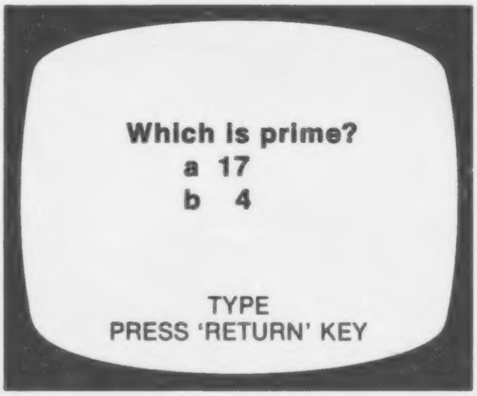
- Large easy-to-read upper/lower case letters
- **ADD/DELETE** for all files as desired
- **STUDENT PLANNING** keeps track of the errors students make and saves them on the teacher's file for later review.

11-08 .... $35.95

MATH CONCEPTS

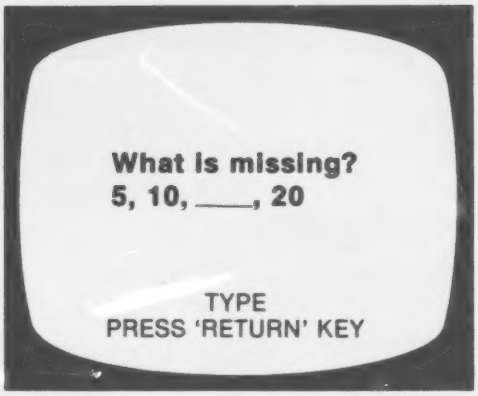
Elementary Concepts in Mathematics. Lessons include before-after; prime numbers; less than-greater than; place value; odd-even; decimal words; rounding; counting by 2's, 5's and 10's.

Simple introductory presentations are made for each concept. Lessons gradually increase in difficulty.



Which is prime?
a 17
b 4

TYPE
PRESS 'RETURN' KEY



What is missing?
5, 10, ____, 20

TYPE
PRESS 'RETURN' KEY

SPECIAL FEATURES

- Large easy-to-read upper/lower case letters
- **ADD/DELETE** for all files if desired
- **STUDENT PLANNING** posts errors to the teacher's file for later review.

11-09 .... $39.95

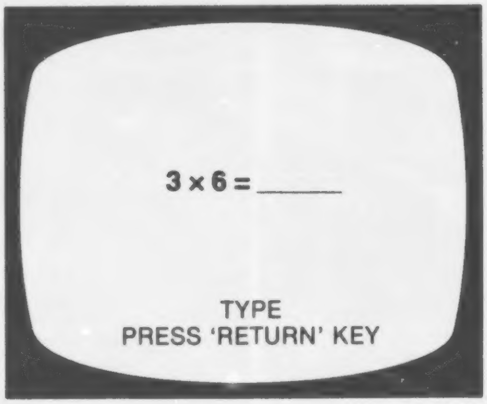
PRESCRIPTIVE MATH DRILL

PMD is one of the best drill and practice programs available.

The teacher enters the names of the students into the file. He/she then sets the level at which the students are to begin work. The teacher also decides what percent accuracy is necessary to advance to another level.

ADDITION	5	(sums to 5)
SUBTRACTION	6	(differences to 6)
MULTIPLICATION	3	(facts with 3's)
DIVISION	4	(facts with 4's)

PASSING SCORE: 85%



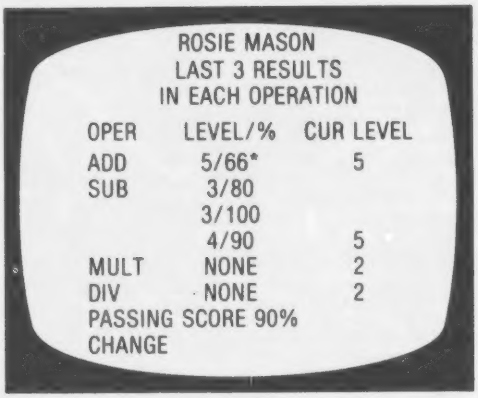
```
3 x 6 = ______

TYPE
PRESS 'RETURN' KEY
```

After the student has completed 20 ramdomly presented problems at the prescribed passing level, the computer automatically moves the student to the next higher level.

The MENU allows the teacher excellent control.

#1 and #2 ADD and DELETE STUDENTS
Allows students to be added or deleted at any time. The computer will store records for up to 100 students.

#3 VIEW/CHG STUDENT



```
           ROSIE MASON
          LAST 3 RESULTS
        IN EACH OPERATION
OPER      LEVEL/%     CUR LEVEL
ADD        5/66*          5
SUB        3/80
           3/100
           4/90           5
MULT       NONE           2
DIV        NONE           2
PASSING SCORE 90%
CHANGE
```

*Rosie worked at level 5
with 66% accuracy

TYPE
PRESS 'RETURN' KEY

#4 DSPLY/PRNT ALL STUDENTS
Allows the teacher to change the current level and the passing score for each student.

#5 CLEAR ALL RECORDS
Allows the teacher to clear all records.

#6 DSPLY/PRINT NAMES & PASWRDS
Each student has an assigned password. No student can have access to another student's file.

Of course, all records can be printed at any time or viewed by the teacher on the vidio.

14-01 .... $79.95

CREATE YOUR OWN

A unique series of five specially designed programs, which allows teachers to CREATE their own courseware, has been developed. We realize that many teachers can not, and do not have any desire to write their own programs. Teachers do, however, have some excellent ideas about the content. By using the CREATE YOUR OWN disks, teachers can build lessons which directly correspond to their own reading and math programs.

Using the CREATE YOUR OWN disks, the teacher types in his/her own examples, questions, or word lists. The documentation for each disk gives examples of various types of programs that can be created. There are literally hundreds of programs that you can make.

There are five separate disks that can be used.

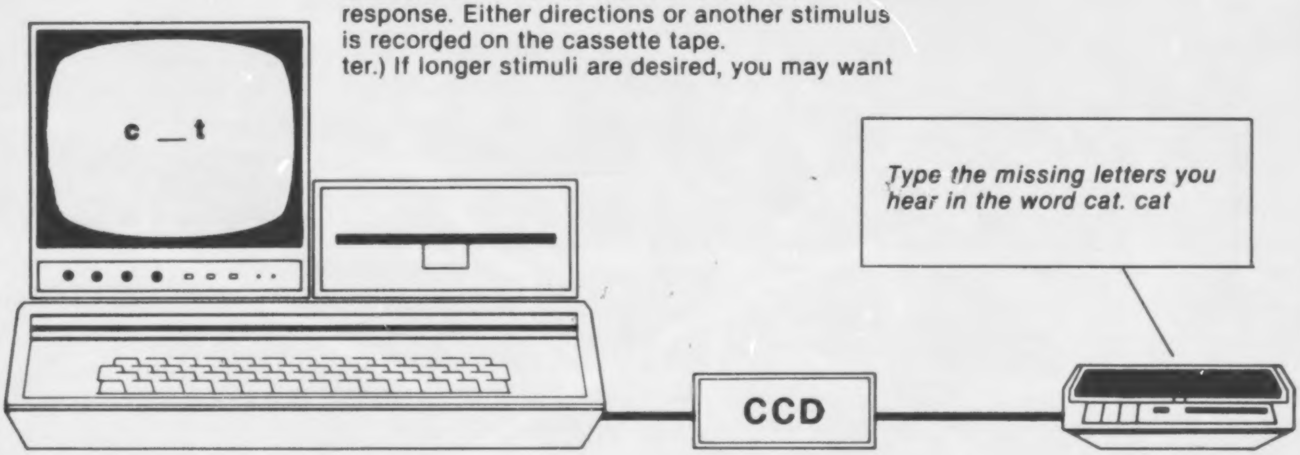
01-00	FILL IN THE BLANK
03-00	SPELLING
04-00	VOCABULARY
11-00	SKILL DRILL — ELEMENTARY
12-00	SKILL DRILL — INTERMEDIATE

CREATE disks have the following
SPECIAL FEATURES

- Large easy-to-read lower case letters for disks 01, 04, and 11
- Each disk will hold fifty different files of up to 20 presentations per file.
- Tapes used with 01, 03, and 04 are easy to record. Directions and sample scripts are included in the documentation.
- The **STUDENT PLANNING** special feature is on all CREATE disks. This feature will keep track of the errors your students make as they work through the lessons. If you have a printer, you can have printed reports of all student records.
- Up to 100 students' records can be saved on each CREATE disk.
- Complete documentation makes program development easy even if the teacher has no programming skills and minimal experience with a computer.

01-00 CREATE YOUR OWN — FILL IN THE BLANK

This program allows the teacher to create a series of lessons that have a visual stimulus with at least one blank and one correct response. Either directions or another stimulus is recorded on the cassette tape.
ter.) If longer stimuli are desired, you may want



Type the missing letters you hear in the word cat. cat

01-00 .... $19.95

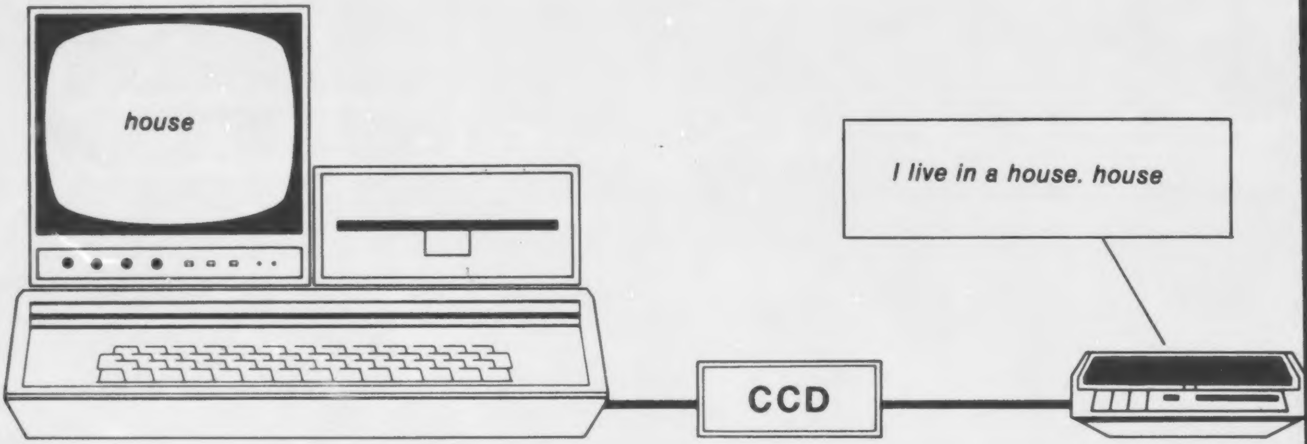
03-00 CREATE YOUR OWN — SPELL IT

This disk is identical to the spelling disk listed under the Reading and Language arts section.

03-00 .... $19.95

04-00 CREATE YOUR OWN — VOCABULARY

This special program has been developed specifically to help teachers build vocabulary drill and individualized testing. The disk will hold over 50 different lists of 40 words each.

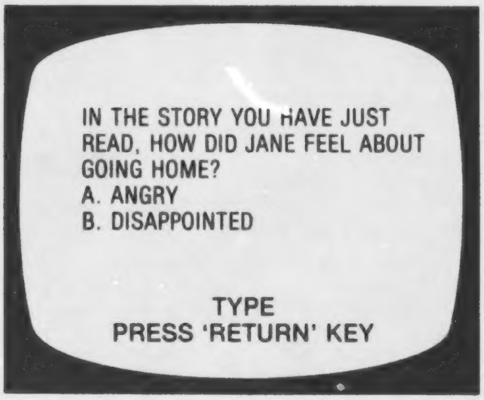

house
I live in a house. house
CCD

04-00 ....$19.95

12-00 CREATE YOUR OWN — INTERMEDIATE

This CREATE disk is similar to ELEMENTARY accept it allows the teacher to type in longer sentences. Regular Apple ALL-CAP type is used in place of the large graphics letters.

Instructions may be placed at the beginning of each lesson.



```
IN THE STORY YOU HAVE JUST
READ, HOW DID JANE FEEL ABOUT
GOING HOME?
A. ANGRY
B. DISAPPOINTED


              TYPE
       PRESS 'RETURN' KEY
```

12-00	$26.95

Address all orders to:

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01-02	Vowels	Part of Skill Drill #1—Vowels
01-03	Consonants/Blends	Extension of Skill Drill #1—Consonants
08-02	Letter Recognition	Part of Skill Drill #8
02-01	Multiple Skills	Identical to Skill Drill #2 with all files
13-01	WordSearch	Identical
12-05	Roots/Affixes	New
12-06	Homonyms	New
12-07	Antonyms/Synonyms	New
12-08	Verbs	New
12-09	Nouns/Pronouns	New
04-05	Vocabulary-Dolch	New
04-02	Vocabulary-Elementary	Identical to Skill Drill #4 with vocabulary
03-00	Spell It	Identical to Skill Drill #3
09-01	Word Families	Identical to Skill Drill #9
11-02	Calendar Skills	Calendar Skills from #11
07-02	Who-What-When-Where	Files from #7 (or #5)
14-01	Prescriptive Math Drill	Identical to PMD
08-03	Number Words-Level 1	Part of Skill Drill #8
11-05	Number Words-Level 2	New
11-06	Expanded Notation	New
01-01	Clock	Identical to Clock
11-07	Metric Drill	New
11-08	Integers/Equations	New
11-09	Math Concepts	New
01-00	Create-Fill in the Blanks	Identical to Skill Drill #1 no files
03-00	Create-Spelling	Identical to Skill Drill #3 no files
04-00	Create-Vocabulary	Identical to Skill Drill #4 no files
11-00	Create Skills-Elementary	Identical to Skill Drill #11 no files
12-00	Create Skills-Intermediate	New
CCD	Cassette Control Device	Speller Box

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EDUCATION Software Made To Order

CROSSBOW (Breitenbach) Features a target game that, besides offering hours of fun, teaches fractions in an exciting and competitive environment. An educational program for all ages. *02701, PET tape. $9.95*

THE FIRST BOOK OF KIM, 3 Tapes (Butterfield, Ockers, and Rehnke) Three cassettes featuring 28 recreational and 13 utility and diagnostic programs. *00700, KIM-1* (14 recreational programs); *00800, KIM-1* (14 recreational programs); *00900, KIM-1* (13 utility programs); *each tape $9.95*

MICROTYPING (Engel) Features the "touch method" of learning to type for improving your computer skills. *02401, PET; 02403, TRS-80 Level II; 02404, Apple II; each tape $10.95*

GENERAL MATHEMATICS-1 (Gilder) Contains 15 programs useful to anyone who wants to improve their math skills and accelerate their computation. The fifteen programs are: 1. Log to Any Base 2. New Coordinates 3. Rectangular/Polar Coordinates 4. Permutations 5. Combinations 6. Vector Cross Products 7. Vector Scalar Products 8. Max/Min Locator 9. Number Rounder 10. Dimension Scaler 11. Histogram 12. Circle Finder 13. Nth Root of a Number 14. Normally Distributed Random Numbers 15. Rational Fractions. *01101, PET; 01103, TRS-80 Level II; 01104, Apple II; 01105, Sorcerer; each tape $14.95*

COMPLEX MATHEMATICS (Gilder) Contains 8 programs that give the user the ability to perform computations of complex numbers in BASIC rather than in FORTRAN. The eight programs are: 1. Absolute Value 2. Complex Addition 3. Complex Subtraction 4. Complex Multiplication 5. Complex Division 6. Nth Roots of a Complex Number 7. Complex Exponential 8. Complex Number to a Real Power *01201, PET; 01203, TRS-80 Level II; 01204, Apple II; each tape $14.95*

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☐ 04804
☐ 04909
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☐ 05105
☐ 05108
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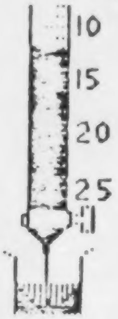

SUG.RET. $100

CHEMISTRY LAB SIMULATIONS #1

Developed by John I. Gelder
Copyright° March 1979

DESCRIPTION:

Developed by a chemistry professor at Oklahoma State University, this set of simulations is designed as an educator's lecture aid as well as an exciting learning tool for individual study. Using high-resolution graphics, the programs dynamically simulate these introductory-level chemistry lab experiments:

- ACID-BASE TITRATION
- DETERMINATION OF A WEAK ACID EQUILIBRIUM CONSTANT involves two simulations:
  - A TITRATION EXPERIMENT
  - A pH-METER EXPERIMENT
- DETERMINATION OF AVOGADRO'S NUMBER involves two simulations:
  - A TITRATION EXPERIMENT
  - A MONOMOLECULAR FILM EXPERIMENT

FEATURES:

- Easy to use and fun to use!
- The user is given easy-to-follow instructions before and during each experiment.
- Dynamic illustrations in high-res graphics.
- The programs provide randomly generated initial values to insure that the experiments can be used over and over without arriving at the same results each time.

APPLE II : ITEM# 6415

MINIMUM : 32K APPLE II w/APPLESOFT CARD OR LANGUAGE CARD or
HARDWARE : 32K APPLE II PLUS
: DISK II

ATARI 800: ITEM# 6441

MINIMUM : 32K ATARI 800 computer
HARDWARE : ATARI 810 disk drive

ITEM# 6416 SUG.RET.:$100

CHEMISTRY LAB SIMULATIONS #2

Developed by John I.Gelder & Rick Snelling
Copyright© March 1979
High Technology,Inc./Okla. State Univ.

DESCRIPTION:

CHEMISTRY LAB SIMULATIONS #2 is a powerful teaching tool for the college or high school professor of introductory chemistry. The programs are also useful for individual study by chemistry students. They utilize Apple's colorful low-res graphics and they are written in machine language for fast response time. For example, one of the programs illustrates the IDEAL GAS LAW:

$$PV=nRT$$

During this illustration, the ideal gas is represented on the video screen as particles bouncing & colliding with one another in space. The student is allowed at any time to alter any of the four parameters which affect ideal gas behavior. (The four parameters are: Pressure, Volume, Temperature, and number of moles of gas.) IMMEDIATELY after altering a parameter, the student will see the effect of the change on the other three parameters and on the behavior of the gas.

The other two programs in the package illustrate the ENTROPY of ideal gases.

FEATURES:

* Easy to use and fun to use!
* Dynamic illustrations in colorful graphics.
* Can be used as a lecture tool or for individual study.

MINIMUM : 32K APPLE II w/APPLESOFT CARD OR LANGUAGE CARD or
HARDWARE : 32K APPLE II PLUS
: DISK II

OPTIONAL : Color TV or color monitor
HARDWARE : (Programs fully usable with black & white only.)

APPLE II

EDUCATIONAL SOFTWARE

Low cost
Quality software
Classroom tested
Designed by educators

IDEATECH CO.
P.O BOX 62451
SUNNYVALE, CA 94088

EDUCATIONAL SOFTWARE

APPLE II PLUS

EDUCATIONAL SOFTWARE
APPLE II -- APPLE II PLUS
FROM IDEATECH

NAME OF SOFTWARE: **Mathgrid**

LEARNING OBJECTIVES:

The program is designed to improve the student's accuracy with the 0 to 9 multiplication tables, in addition to reinforcing the concept of identifying unique points on an x-y coordinate system.

PROGRAM DESCRIPTION:

Mathgrid provides drill and practice with the 0 to 9 multiplication tables for one or two players. A 10 by 10 grid is drawn on the screen with the horizontal and vertical axes labeled 0 to 9. The student selects one to forty problems to be worked and the computer randomly chooses and marks that number of locations on the grid. The student selects a problem by identifying the correct x and y coordinates for the desired problem location. The computer then presents the problem and accepts the student's answer. The computer provides the correct answer if the problem is missed twice. A running score is kept on the screen and the total score is provided at the end of the game. Auditory feedback is used throughout the program.

GRADE LEVEL: 3-5 and remedial

COMPUTER REQUIREMENTS:

Language: Applesoft
Apple II Plus or Apple II with Applesoft ROM card

AVAILABLE ON DISK YES X NO____ MEMORY RQD. 16K

AVAILABLE ON CASSETTE YES X NO____ MEMORY RQD. 16K

An additional 16K of memory is required if the Apple II computer is used with Applesoft loaded from disk or cassette rather than resident on the Applesoft ROM card.

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EDUCATIONAL SOFTWARE
APPLE II -- APPLE II PLUS
FROM IDEATECH

NAME OF SOFTWARE: **Speed Facts**

LEARNING OBJECTIVES:

Speed Facts is designed to improve the student's accuracy and rate of response for addition, subtraction, multiplication and division facts.

PROGRAM DESCRIPTION:

The program provides practice with addition, subtraction, multiplication and division facts for one to three students at a time. The students may choose the operation, the level of difficulty of the problems and the speed of problem presentation for a set of ten problems. If a student does not answer a problem within the selected time limit, he/she is told, "you took too long!" After the second error on a problem, the student is given the answer. The score for all players is shown throughout the game on a scoreboard.

GRADE LEVEL: 1-5 and remedial

COMPUTER REQUIREMENTS:

Language: Applesoft
Apple II Plus or Apple II with Applesoft ROM card

AVAILABLE ON DISK YES_X_ NO_____ MEMORY RQD._16K___

AVAILABLE ON CASSETTE YES_X_ NO_____ MEMORY RQD._16K___

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EDUCATIONAL SOFTWARE
APPLE II -- APPLE II PLUS
FROM IDEATECH

NAME OF SOFTWARE: **Multiplication & Division Fun**

LEARNING OBJECTIVES:

Multiplication and Division Fun provides practice in multiplication and division facts and improves the student's performance by drilling on missed problems at the end of the lesson.

PROGRAM DESCRIPTION:

This software provides practice with the multiplication and division tables. The student may choose which operation to practice and may choose to practice a specific table within the operation or problems randomly chosen from all the tables of the specified operation. Twenty problems are presented to the student. After the second error on a problem, the answer is given to the student. Feedback is given after each answer and the score is shown throughout the game in the form of the number correct and as a percentage. After all twenty problems have been attempted, the problems which were answered incorrectly are presented again as a review.

GRADE LEVEL: 3-5 and remedial

COMPUTER REQUIREMENTS:

Language: Applesoft
Apple II Plus or Apple II with Applesoft ROM card

AVAILABLE ON DISK YES__X__ NO____ MEMORY RQD.__16K__

AVAILABLE ON CASSETTE YES__X__ NO____ MEMORY RQD.__16K__

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EDUCATIONAL SOFTWARE
APPLE II -- APPLE II PLUS
FROM IDEATECH

NAME OF SOFTWARE: **Basic Electricity**

LEARNING OBJECTIVES:

The program is designed to introduce the student to the fundamental aspects of electricity. The student interacts with the computer as diagramatic representations are used to introduce the concept of current flow and open, closed and short circuits. The program also stimulates logical thinking as the student must extrapolate from the presentation information in order to solve a switch puzzle presented within the lesson.

PROGRAM DESCRIPTION:

Basic Electricity presents a lesson on the fundamental concepts of current flow and open, closed and short circuits through the use of mixed screen text and Hi-Res graphics. The program is constructed of four parts: the lesson, a puzzle, a quiz and a demonstration. The lesson is presented through a Hi-Res graphics drawing of a battery, lightbulb, switch and interconnecting wires. The student interacts with the program to gain an understanding of current flow and open, closed and short circuits. The puzzle places a group of series and parallel switches between the battery and the lightbulb. The student must select the correct combination of switches to open or close in order to light the bulb. The quiz presents five multiple choice questions to test the student's understanding of the lesson.

GRADE LEVEL: 2-8

COMPUTER REQUIREMENTS:

Language: Applesoft
Apple II Plus or Apple II with Applesoft ROM card

AVAILABLE ON DISK YES X NO ___ MEMORY RQD. 48K

AVAILABLE ON CASSETTE: YES ___ NO X MEMORY RQD. ___

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EDUCATIONAL SOFTWARE
APPLE II -- APPLE II PLUS
FROM IDEATECH

NAME OF SOFTWARE: **Color Guess**

LEARNING OBJECTIVES:

Color Guess teaches the reading and spelling of color words by associating the color with the correct color word as displayed on the screen.

PROGRAM DESCRIPTION:

Color Guess gives the student an opportunity to learn to read and to spell ten color words. During the introduction, a smiling face and the matching color word are shown in Low-Res graphics. The student may choose to watch as each of the ten faces and color words are shown or may choose to proceed to the reading or spelling portion of the program. During the reading segment of the program, a face is presented with three color words printed in the text mode. The student associates the color of the face to one of the words by typing the appropriate color word. During the spelling segment the student is shown a face and must type the color word from memory. After each correct response the face will smile, the color word will appear in graphics and one of four reinforcements will occur. If the response is incorrect, the face will frown and the correct color word will appear.

GRADE LEVEL: Preschool-2

COMPUTER REQUIREMENTS:

Language: Integer Basic
Apple II or Apple II Plus with Integer ROM card

AVAILABLE ON DISK YES X NO____ MEMORY RQD. 16K

AVAILABLE ON CASSETTE YES X NO____ MEMORY RQD. 16K

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EDUCATIONAL SOFTWARE
APPLE II -- APPLE II PLUS
FROM IDEATECH

NAME OF SOFTWARE: **Word Flash**

LEARNING OBJECTIVES:

Word Flash develops visual memory and spelling skills.

PROGRAM DESCRIPTION:

The program enables the student to increase spelling and visual memory skills. The student may choose the level of difficulty of the words and may choose the speed of presentation for each set of words. A student may play the game by matching the flashed word to one of three words provided as clues or may type the flashed word from memory without using the clue words. After two incorrect answers, the correct answer is given to the student. The score is kept on a scoreboard throughout the game and feedback is given after each answer. Ten words which are randomly chosen from a bank of words at the specified difficulty level are presented during each game. The bank of words can be changed by anyone with beginning programming knowledge. Directions for adding and changing words are given in the program listing.

GRADE LEVEL: 1-8

COMPUTER REQUIREMENTS:

Language: Applesoft
Apple II Plus or Apple II with Applesoft ROM card

AVAILABLE ON DISK YES X NO ___ MEMORY RQD. 16K
AVAILABLE ON CASSETTE YES X NO ___ MEMORY RQD. 16K

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EDUCATIONAL SOFTWARE
APPLE II -- APPLE II PLUS
FROM IDEATECH

NAME OF SOFTWARE: **Questions & Story**

LEARNING OBJECTIVES:

The program promotes reading as a fun activity, encourages creativity and provides practice in categorization.

PROGRAM DESCRIPTION:

Questions and Story provides reading practice for all students and motivates the most reluctant readers to participate. Seven questions are presented to the student. The answers are incorporated into one of three randomly chosen stories and presented to the student at one of three reading speeds.

GRADE LEVEL: 2-6 and remedial

COMPUTER REQUIREMENTS:

Language: Applesoft
Apple II Plus or Apple II with Applesoft ROM card

AVAILABLE ON DISK YES X NO ____ MEMORY RQD. 16K

AVAILABLE ON CASSETTE YES X NO ____ MEMORY RQD. 16K

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☐ COLOR GUESS	$7.95	$6.95	$
☐ WORD FLASH	$9.95	$8.95	$
☐ MULTI & DIV FUN	$7.95	$6.95	$
☐ QUESTIONS & STORY	$6.95	$5.95	$
☐ BASIC ELECTRICITY	$12.95	NOT AVAIL	$
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COMPUTER CHEMISTRY

PROGRAMS FOR THE APPLE II

15 C.A.I. HIGH SCHOOL AND JR. COLLEGE
CHEMISTRY PROGRAMS

FEATURING

1. Reviews and teaches main concepts in each topic.
2. No two students get exactly the same questions.
3. Each program requires 20-30 minutes to complete.
4. A fun and motivating way to learn.
5. Names and grades can be stored on a disk file (optional).
6. All programs have been thoroughly tested and debugged.

TITLES

GAS RELATIONSHIPS
MOLES AND FORMULAS
CHEMICAL EQUATIONS
SOLUTIONS
PERIODIC TABLE
ELECTRON STRUCTURE
BONDING IN MOLECULES
BONDING BETWEEN MOLECULES
KINETICS
EQUILIBRIUM
ELECTROCHEMICAL CELLS
OXIDATION-REDUCTION
ACID-BASE THEORIES
ACID BASE PROBLEMS
ORGANIC CHEMISTRY

COST

$ 19.50 for one program
$ 75.00 for a set of six
$150 for the complete set (15)

Specify Cassette, Tape
or Disk
Requires 32K Applesoft Ram or Rom

FROM

J & S SOFTWARE
140 Reid Avenue
Port Washington, N.Y. 11050

J & S SOFTWARE

THE CHEMISTRY PROGRAMS FOR THE APPLE II AND TRS-80 (LEVEL II & MODEL III)

Computer assisted instruction for high school and junior college chemistry classes. Each program teaches and reviews the main concepts in each topic. No two students get exactly the same questions. A wrong response to a question results in reinforcement from added information and a similar question on the same topic. Each program requires 20-40 minutes to complete.

COSTS

$ 19.50	for any one program
$ 75.00	for a set of any 6 programs
$ 150.00	for all 15 programs

MOLES AND FORMULAS - Includes material on converting grams to moles, number of molecules to moles, as well as Avogadro's relationship and percent composition.

CHEMICAL EQUATIONS -- Students get practice with balancing equations, mole relationships in equations and weight-weight problems.

GAS RELATIONSHIPS - Boyle's Law, Charle's Law, partial pressure, volume-volume equation relationships, weight-volume equation problems and densities of gases are covered in this unit.

SOLUTIONS - Students practice and learn naming, ion concentration, molarity, calorie problems, and the formation of precipitates.

PERIODIC TABLE - Relationships students review are formulas, atomic radius, mass number, ionization energy, activity, combining capacity, and the number and type of each type of particle in an atom.

ELECTRON STRUCTURE - Practice with this unit gives a better understanding of orbitals, valence electrons, electron structure, filling of sublevels and the relationship of valence electrons to the periodic table.

BONDING IN MOLECULES - Besides covalent and ionic bonding students practice on problems covering bonding properties, and the relationship of bonding to the periodic table.

BONDING BETWEEN MOLECULES - This unit gives students practice with concepts related to hybridization, shapes of molecules, Van der Waals forces, and network bonds.

KINETICS - In kinetics students practice with problems covering the topics of reaction rates, collision theory, heat of reaction, and activation energy.

ACID BASE THEORIES - Exercises on Bronsted Lowry theory, naming acids, neutralization reactions and salts are covered in this practice lesson.

ACID BASE PROBLEMS - Students are asked questions dealing with pH, titration problems, dilution of acids and the neutralization of solid bases.

ELECTROCHEMICAL CELLS - Questions pick random variables for problems on electrochemical cells, voltages, oxidizing and reducing agents in cells, and the direction of both electron flow and ion flow.

OXIDATION REDUCTION - In this computer lesson students review oxidation numbers, half reactions, balancing oxidation reduction reactions and determining the number of electrons lost and gained.

EQUILIBRIUM - This computer unit helps students review Le Chatelier's principle, calculating the equilibrium constant and relating Ksp to solubility of a compound.

ORGANIC CHEMISTRY - Questions on identifying isomers, names of simple hydrocarbons and their isomers, functional groups, and somes types of reaction are asked.

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BIOLOGY

PROGRAMS FOR THE APPLE II

15 C.A.I. HIGH SCHOOL AND JR. COLLEGE BIOLOGY PROGRAMS

FEATURING

1. Latest branching techniques. Branches to questions in sub-program on any concept with which student has difficulty.
2. Requires 20 minutes to 1 hour for completion of a unit.
3. Each lesson uses the following three programs:
    - A. One that keeps track of questions and responses.
    - B. A file containing master questions plus background material.
    - C. A file of branch material for students needing additional help.
4. Format is question → information → more information
5. Student names and grades are stored on a 4th program
6. Reviews and teaches main concepts in each topic

TITLES

TRANSPORT	LOCOMOTION
ASEXUAL REPRODUCTION	PHOTOSYNTHESIS AND TRANSPORT
CELLS	RESPIRATION
NERVOUS SYSTEM	GENETICS
EXCRETION	CLASSIFICATION
ENDOCRINE SYSTEM	REPRODUCTION PLANTS
DIGESTION	ANIMAL REPRODUCTION
BIOCHEMISTRY	

COST

$ 19.95 for one program
$ 80.00 for any six
$160.00 for the complete set (5 disks)
Requires 32K - Disk Drive
Applesoft

FROM

J & S SOFTWARE
140 Reid Avenue
Port Washington, N.Y. 11050

J & S Software
140 Reid Avenue
Port Washington, N.Y. 11050

THE BIOLOGY PROGRAMS

Computer assisted instruction for high school biology classes. Each program reviews and teaches the main concepts in the topic. Program branches to sub-program for reinforcement in areas where students have difficulty. If a student responds incorrectly to a question he is given background information and another chance. Student's names, grades, and how far they have gotten is automatically recorded. A typical lesson requires 30 to 60 minutes to complete.

COSTS
=====

$ 19.95 for any one program
$ 80.00 for any 6 programs
$ 160.00 for all 15 programs

CELLS - In this program students are questioned and given information on cell theory, cell structures, single celled organisms, and the differences between animal and plant cells.

TRANSPORT - Students get an opportunity to review the blood system, the lymph system, blood cells, and blood types.

ASEXUAL REPRODUCTION - The emphasis in this unit on cell division is on mitosis and meiosis. Also included is asexual reproduction in simple organisms.

EXCRETION - Besides reviewing the nature of metalolic wastes, students study how wastes are removed in some simple organisms and how the kidneys function in humans.

ENDOCRINE SYSTEM - In this computer lesson the emphasis is on hormones that are secreted by the ductless glands, the effects of these hormones, and some of the problems that may develop when too little or too much hormones are produced.

BIOCHEMISTRY - In the unit on biochemistry students review and learn some basic atomic structure, balancing equations, and properties of proteins and carbohydrates.

DIGESTION - Students are asked questions dealing with nutrients, digestion in simple organisms, and the digestive process in humans.

LOCOMOTION - This computer unit helps students review the function of bones and muscles as well as the topics of types of muscles and joints.

PHOTOSYNTHESIS AND TRANSPORT - Practice with this unit gives students a better understanding of photosynthesis, the transport system of plants, and the function of various kinds of plant cells.

REPRODUCTION PLANTS - In this unit the topics covered include asexual reproduction and sexual reproduction in plants. There is a strong emphasis on processes that take place within the flower.

RESPIRATION - In respiration students practice on questions covering the process of cellular respiration, the structures that are involved, and the chemistry of the process.

GENETICS - Questions and background information for those needing it includes the results from various crosses on peas, four o' clocks, and fruit flies. There is also material on sex-linked diseases.

ANIMAL REPRODUCTION - The emphasis in this computer unit is on the development of the sperm, egg, and the fertilzed egg.

CLASSIFICATION - In classification students review the organization of living things.

NERVOUS SYSTEM - In this computer program students study the nature of a nervous impulse, nerve impulses in simple organisms, reflexes, and the chemicals involved in the transfer of impulses.

Krell Software

PROGRAMMERS
We are constantly seeking to improve the quality and variety of our program offerings. If you have an original and exciting program for the TRS-80, Apple, or PET - we would like to evaluate it for possible inclusion in our software line. If you are interested, please contact us!
516-751-5139

TO ORDER: Visa and Master Card accepted or write to:
Krell Software
21 Millbrook Drive
Stony Brook, N.Y. 11790, include machine type, cassette or disk.
Check or money order.

NOTES: All programs require 16K. All Apple programs require APPLESOFT BASIC. TRS-80 programs require Level II Basic. TRS—80 is a trademark of the Tandy Corp. Apple II and Apple II plus are trademarks for Apple Computer Inc. PET is a trademark of the Commodore Corp.

COLLEGE BOARDS

for TRS, PET & Apple

The best way to sharpen your skills for the College Boards is to work on actual examinations. Each of these program sets confronts the user with a virtually limitless series of questions and answers. Each program is based on past exams and presents material of the same level of difficulty and in the same form as used in the College Board examination. Scoring is provided in accordance with the formula used by College Boards.

SAT, PSAT, N.M.S.Q.T., set includes 7 programs covering Vocabulary, Word Relationships, and Mathematics. $79.95

Special Educator Edition

Includes all of the above programs plus detailed solutions and explainations for each problem plus drill exercises. SAT set includes 14 programs. $149.95

These programs were designed by a former professor at U.C. Berkeley, SUNY at Stony Brook and a senior staff officer at the National Academy of Sciences.

Independently conducted studies show a difference in test scores between those using our programs and a control group of almost 100 points. Details furnished upon request.

*Programs are available on either disk or cassettes for Apple and TRS-80, PET is available on cassette only.

GRADUATE RECORD EXAMS

for TRS-80, PET & Apple

The best way to sharpen your skills for the Graduate Record Examination is to work on actual examinations. Each of these program sets confronts the use with a virtually limitless series of questions and answers. Each program is based on past exams and presents material of the same level of difficulty and in the same form used in the Graduate Record Examination. Scoring is provided in accordance with the formula used by the GREs.

GRE sets includes 10 programs covering Vocabulary, Word Relationships, Mathematics, Logical Diagrams, Analytical Reasoning. $139.95

Educator GRE

Includes all of the above programs plus detailed solutions and explainations for each problem plus drill exercises. Graduate Record exam set includes 20 programs. $199.95

These programs were designed by a former professor at U.C., Berkeley, SUNY at Stony Brook and a senior staff officer at the National Academy of Sciences.

*Programs are available on either disk or cassette for APPLE and TRS-80; PET is available on cassette only.

MATH SOFTWARE

1233 Blackthorn Place
Deerfield, Illinois 60015

NEW
"SECOND GENERATION" SOFTWARE

Computer Math "Apple"-cations

All programs are designed to run on Apple II Plus or Apple II with Applesoft ROM Firmware Card using disk drives.

PRICING INFORMATION

Each program designed for 32K system	$15.00
Each program which requires 48K	$25.00
Disk and Handling Fee (Is waived for orders over $50.00)	$ 8.00
Shipping outside United States	$ 5.00

Price/Specifications/Availability are subject to change without notice.

PURCHASING INFORMATION

Please complete the order form and send it to MATH SOFTWARE along with either a check or money order. The $8.00 disk and handling fee is waived for orders over $50.00. Orders will be filled upon receipt of complete payment. Please specify memory size. Be sure to specify a street address since we will not ship to a post office box. Software orders will, of course, not be refunded.

WARRANTY INFORMATION

Math Software will replace defective software which is returned within seven days provided that the software has not been altered. The purchaser of software accepts and uses it at his own risk. Math Software shall not be liable for any damages arising from the use or performance of its products.

CURRENT POLICY restricts sales to schools only. Purchase orders are acceptable.

Yes, you can take an Apple™ to the students. Take it directly to the students in the mathematics classroom where it can be used as an invaluable teaching aid! Many apple purchasers had the insight to see its tremendous potential for the educational process but have frankly discovered that it is very difficult for the teacher to develop quality software given the time demands of classroom teaching.

Math Software has made a committment to enhancing the educational process by providing software which unlocks the phenomenal color graphics potential of the Apple. This exciting software dramatically demonstrates concepts which the teacher is trying to communicate. Many are discovering that its use helps to make each teacher a better teacher and each student a better student!

Students are excited about the variety of instruction which utilizes color graphics and its effect on motivation is unmistakable. Teachers who use the software appreciate the instructional assistance and students recognize their forsight to use innovative teaching techniques!

We are confident that you will like Math Software products and hope that you will try them. You will agree that purchasing quality software is a smart investment compared to the teacher time requirements for writing and debugging software!

This catalog contains many exciting new releases and several updates in addition to the avant-garde spring release. To a math teacher, an Apple II without mathematics software is like a piano without a keyboard!

NEW PACKAGE PRICING

Math Software is introducing a new package pricing option. It provides very attractive prices for package purchases and helps to provide software which is appropriate for the level of instruction. The package prices and components are listed below. Sorry, substitution requests cannot be honored. Individual programs may, of course, still be ordered a la carte style.

JUNIOR HIGH PACKAGE

Function Grapher 48K
Solving Linear Equations 48K
Solving Simultaneous Linear Systems 48K
Arithmetic Racing
Binomial Multiplication
Orbiting and Rotating Figures

STARTER PACKAGE (Secondary level)

Function Grapher 48K
Solving Simultaneous Linear Systems 48K
Arithmetic of Functions
Sine and Cosine Grapher

SECONDARY PACKAGE

Function Grapher 48K
Solving Linear Equations 48K
Solving Simultaneous Linear Systems 48K
Arithmetic of Functions
Arithmetic Racing
Binomial Multiplication
Limacons and Their Areas
Limits of Sequences
Orbiting and Rotating Figures
Polar Graphing
Sine and Cosine Grapher

LIMACONS AND THEIR AREAS

This program consists of three parts. The first section describes limacons whose equations are $r = a + b \sin(t)$ or $r = a + b \cos(t)$. The effects of changing the values of a and b are described in written form and also shown graphically. Also the effects of using the sine function or the cosine function are shown.

The second section allows the user to choose the values of a and b and cosine or sine. The program then graphs the limacon on the hi-resolution screen. The third section allows the user to calculate various areas enclosed by the limacon. The program will give an approximate value of this area.

Memory Requirement with Disk is 32K $15.00

SINE AND COSINE GRAPHER

This program is ideal for demonstrating the effect that the constants A, B, and C have on the graphs of the functions $y = A\sin(Bx+C)$ and $y = A\cos(Bx+C)$. The user can choose either the "sin" or "cos" function as well as the values of A, B, and C. The program graphs this chosen function on the high resolution screen. Several such graphs can be superimposed on the coordinate system in different colors so that the effects of changing A, B, and C can be readily distinguished by the students. Hence the student can see the effects of amplitude, period, and phase shift changes quickly, dramatically, and in color on the screen. This is an exceptional demonstration program of the relationships involved in sine and cosine graphing.

Memory Requirement with Disk is 32K $15.00

SOLVING LINEAR EQUATIONS 48K

Now there is something that you can do to help the student who needs assistance to really understand solving linear equations. The program provides a graphic model of linear equations and provides for a computer solution as well as user solution to isolate the variable. This graphic model of a linear equation provides a very vivid picture and is excellent for classroom presentation as well as individual "tutorial" use.

The second part of the program provides individual practice to solve equations of the form Ax + B = C + Dx. The user can select either rational or integral coefficients depending upon his skill level. Of course appropriate error messages are included throughout the program to guide the user. This program is intended for individual use as well as classroom introduction and will be especially helpful to the student who requires assistance.

Memory Requirement with Disk is 48K $25.00

SOLVING SIMULTANEOUS LINEAR SYSTEMS 48K

Here is an excellent demonstration program for the teacher to use or it may be used as a drill and practice program for individual students to reinforce the Multiplication-Addition method of solving two linear equations in two unknowns. The program allows students to interact with the computer to solve the given randomly generated linear system of equations. If the student correctly solves the system, a high resolution graph of the two equations is given to demonstrate that his algebraic solution is identical to the intersection of the original two equations. This program reinforces the geometric and algebraic equivalence of finding the ordered pair where the linear equations intersect.

If the student is having difficulty solving the system, appropriate error messages are produced. As the student or teacher solves the system by the Multiplication-Addition method the resulting intermediate equations of his partial solution are produced. This program will not only give the student a better grasp of the Multiplication-Addition method but will greatly enhance his geometrical understanding of the result.

Memory Requirement with Disk is 48K $25.00

DERIVATIVE OF SINE

This program is a demonstration program for use by the teacher which gives a very convincing argument that the derivative of the sine function is indeed the cosine function. This program uses color and the Apple's high resolution graphics to enhance the student's understanding of this important result. Anyone who has proved that the derivative of the sine function is the cosine function, using inequalities and limits, will appreciate the clarity and beauty of this demonstration.

Initially the sine function is graphed and then moving tangents to the sine function are drawn and the values of the slopes recorded. Then the graph of the slope values is plotted as the tangents again move along the curve. Finally, the cosine function is plotted and shown to coincide with the slope values which were plotted earlier. Once your students see this demonstration, their understanding of the graphical relationships of a function, its derivative, and of the tangent lines to the function in general as well as the result that the derivative of the sine function is the cosine function will be greatly enhanced.

Memory Requirement with Disk is 32K $15.00

FUNCTION GRAPHER 48K

Every school from junior high through college will want this "electronic blackboard." The opening menu offers the user the choice of circular (trig) functions, absolute value functions, greatest integer functions, polynomial functions, or user-supplied functions. Once inside the circular function category, the user may select either sine, cosine, tangent, cotangent, secant, cosecant or choose to supply his own circular function. If the user selects the polynomial function category he is offered the choice of linear, quadratic, cubic, or quartic function or the opportunity to supply a special function.

Regardless of the category, once a specific function has been selected the user supplies each coefficient. To enable an investigation of the role of the coefficients, the user may also elect to have the computer graph a second function on the same set of axes! The user-supplied category enables the user tremendous latitude and ingenuity. It offers a choice of axis system best suited to the user-supplied function and also has a provision for graphing the inverse of the supplied function.

Function Grapher 48K is an invaluable instructional aid in the mathematics classroom. Do not be surprised if your students want to work with it independently also!

Memory Requirement with Disk is 48K $25.00

MULTI-FUNCTION GRAPHER 32K

Since some schools do not have 48K systems, Function Grapher 48K was divided into Multi-Function Grapher and Polynomial Function Grapher for 32K systems. Multi-Function Grapher includes the circular, absolute value, and greatest integer functions. You will also want Polynomial Function Grapher.

Memory Requirement with Disk is 32K $15.00

POLYNOMIAL FUNCTION GRAPHER 32K

Since some schools do not have 48K systems, Function Grapher 48K was divided into Multi-Function Grapher and Polynomial Function Grapher for 32K systems. Polynomial Function Grapher includes the polynomial functions and the user-supplied function categories. You will also want Multi-Function Grapher.

Memory Requirement with Disk is 32K $15.00

TAYLOR'S SERIES APPROXIMATIONS

How about a little assistance with the graphic interpretation of Taylor's series to provide a level of understanding that most of us probably never attained in graduate school? This program uses high-resolution graphics and color to demonstrate how Taylor series expansions approximate the following functions:

1. $F(x) = \sin(x)$
2. $F(x) = \cos(x)$
3. $F(x) = \ln(1 + x)$
4. $F(x) = e^x$.

The function is plotted and then several Taylor series approximations are plotted on the same graph using different colors. Each successive plot uses more terms of the Taylor series expansion. Through this graphical display one can easily see how the Taylor series does approximate the function. Moreover, the accuracy of the approximation and the rapidity of the convergence of the Taylor series is clearly demonstrated. This program is an excellent demonstration technique for introducing Taylor's series or for reinforcing the concepts presented in the classroom.

Memory Requirement with Disk is 32K $15.00

ARITHMETIC OF FUNCTIONS

This program provides a dazzling display of the computer potential in function graphing. It graphs the function f, the function g, and then the function h = function f operation function g. This process also generates some exciting relationships which can be seen from the graphic displays. Examples include certain limits such as (sin x)/x, |x|/x, and x log x. The menu selections also generate graphic verification of certain trig relationships including a double angle formula, some half-angle formulas, and some quotient relationships.

The eight menu selections for each function followed by the four choices for the operation provide two hundred-fifty six choices. The additional option for user-supplied functions enables a very wide spectrum of both classroom instruction and also individual learning.

Memory Requirement with Disk is 32K $15.00

LIMITS OF SEQUENCES

Would it be easier to communicate the limit of sequence definition if a graphic interpretation was readily accessible? The program graphically displays approximately fifty-five terms of a sequence selected by the user. The epsilon neighborhood of the limit is drawn with the value of epsilon which is supplied by the user. The threshold value, M, is then computed and printed.

This provides a graphic interpretation of the definition of limit of sequences which shows that the nth sequence terms are indeed within the epsilon neighborhood of the limit when n > M. The five menu selections enable the user to choose a suggested sequence or to specify his own sequence choice.

Memory Requirement with Disk is 32K $15.00

BINOMIAL MULTIPLICATION

This program uses the Apple's high-resolution screen and color graphics to demonstrate that

$$(1)\quad (X + A)(X + B) = X^2 + AX + BX + AB$$

is really a true equation. This equality is shown through the use of a very convincing area argument. Have your students ever wondered why $(x + 4)(x + 4)$ is called a "perfect square" and why its result, $x^2 + 8x + 16$, is known as a "perfect square trinomial"? Or have you or your students considered geometrically why $(x + 3)(x - 3) = x^2 - 9$ is known as a "difference of squares"? This program will definitely convince them of the aptness of these titles.

The user may input any value of "A" or "B" from -5 to 5 inclusive. Then through the use of the Apple's high-resolution graphics the equivalence of the right and left hand sides of equation (1) is shown through the use of areas. Once your students have seen this demonstration their appreciation and understanding of binomial multiplication will be greatly enhanced.

Memory Requirement with Disk is 32K $15.00

ARITHMETIC RACING

Here is a game that students can play as often as they wish because they will be developing basic arithmetic skills. Arithmetic Racing is a game of timed arithmetic practice with the versatility to be appropriate for students from the early grades through the early high school years. It can even challenge the speed and accuracy of college math majors and arithmetic whiz kids even though it is designed for students who are learning arithmetic skills and students who can benefit from skills practice.

The player first selects either addition, subtraction, multiplication, or division and then specifies the largest number that he wants the computer to give him. He also selects a speed level from 1 to 5. The computer then assigns a point value to each problem based on these selections. A twenty-five point bonus is added to the score for answering each of the ten questions correctly. Arithmetic Racing provides subtle incentive for the development of arithmetic skills.

Memory Requirement with Disk is 32K $15.00

ORBITING AND ROTATING FIGURES

Orbiting and rotating figures is an excellent demonstration program for introducing solid figures in geometry, discussing orbital mechanics in physics, and for visualizing the solids generated when a planar or 3-D object is rotated in space. The demonstrations include cones (both one and two nappes), cubes, cylinders, pyramids, and octahedrons as well as several others.

Through the use of the game paddles and keyboard you can rotate the objects about their altitudes or a central axis as well as rotate them about an elliptical orbit. You can also change the object's colors and the speed of the rotation. Moreover, it is possible to leave a trail of the object as it is rotated so that you can see where the object was as well as where the object is at the present time. This program should be extremely interesting both to your students and to the members of your mathematics faculty.

Memory Requirement with Disk is 32K $15.00

GRAPHIC INTEGRATION THEORY

Have you ever wished that it was easier t communicate the theory of integration? T program places the graphic theory at the user's finger tips and frees him to devel the important notions of inner (lower) re tangular sum, outer (upper) rectangular s and integration as the limit of rectangul sums. It features a graphic inner rectangular display and a graphic outer rectangu display. These displays are followed by a very valuable numerical listing of the inn rectangular sum, the outer rectangular sum and the numerical evaluation of the corresponding integral.

The six menu selections provide for choice of graph and number of intervals and also allow the user to supply both the lower limit and the upper limit of integration. The dual program, MIDPOINT RULE AND TRAPEZOIDAL RULES, is an excellent extension which provides graphic interpretation of these two approximation techniques.

Memory Requirement with Disk is 32K $15.00

MIDPOINT RULE AND TRAPEZOIDAL RULE

This dual program is an excellent extension of GRAPHIC INTEGRATION THEORY and provides both graphic interpretation and numerical evaluation of the Midpoint Rule and also the Trapezoidal Rule. The six menu selections provide for choice of graph and number of intervals. It also allows the user to supply the lower limit and the upper limit of integration. After graphically displaying the midpoint rectangles or the trapezoids, the numerical listing of the appropriate approximation is listed along with the numerical evaluation of the corresponding integral.

Memory Requirement with Disk is 32K $15.00

RATIONAL FUNCTION GRAPHER

This program allows the user to enter any rational function of the form:

$$y = \frac{(ax^2 + bx + c)^d}{(ex^2 + fx + g)^h} .$$

After entering the values of a, b, c, d, e, f, g, and h, the roots, horizontal asymptotes, and vertical asymptotes are shown. The function is then graphed with the asymptotes drawn. The x and y coordinates are shown as they are graphed. This program can be used to graph linear and quadratic functions as well as more complicated rational functions. Experimentation with various functions will demonstrate the versatility of this program.

Memory Requirement with Disk is 32K $15.00

SOLIDS OF REVOLUTION

This program allows the user to choose from various objects such as triangles, squares, rectangles, hexagons, etc. and use the areas enclosed within these objects as areas to be revolved about an axis. The user can also choose whether he wants the object revolved around an axis touching the area or an axis removed a distance from this area. By using the paddle controls the object is revolved about the chosen axis and the solid of revolution is formed. The paddles adjust the speed of the rotation of the area, the color of the solid generated, and several other functions. This program is ideal for introducing the concept of solids of revolution for calculus classes both from the "disk" and "shell" method point of view.

Memory Requirement with Disk is 32K . $15.00

AREA UNDER A CURVE

This program demonstrates the method of lower sum, upper sum, and Riemann sum approximations for the area under a curve through the use of color and high resolution graphics. The user may choose the type of summation process desired as well as the number of rectangles to be used for the approximation. The curve is graphically represented, the rectangles are shown in color and areas are quantitatively expressed. After completing the approximations the accuracy of that particular process is shown relative to the actual area under the curve. This program is ideal for introducing the definite integral to a beginning calculus class.

Memory Requirement with Disk is 32K $15.00

POLAR GRAPHING

The intent of Polar Graphing is to help the student learn about polar graphing and to provide an instructional tool for the introduction of polar areas. It is also a very interesting method for checking answers after an assignment has been completed.

The menu selections include both the traditional polar graphs which provide opportunity for the study of symmetry and polar graphs of the ellipse, hyperbola, and the parabola. The menu selection also provides the framework for the user to supply a polar equation which is then graphed.

Memory Requirement with Disk is 32K $15.00

CALCULUS Component

Area Under A Curve
Derivative of Sine
Graphic Integration Theory
Midpoint Rule and Trapezoidal Rule
Rational Function Grapher
Solids of Revolution
Taylor Series

COLLEGE PACKAGE

Function Grapher 48K
Area Under A Curve
Derivative of Sine
Graphic Integration Theory
Limits of Sequences
Midpoint Rule and Trapezoidal Rule
Rational Function Grapher
Solids of Revolution
Taylor Series

PACKAGE NAME	Separate Total	PRICE
Junior High Package	$120	$100
Starter Package	80	75
Secondary Package	195	170
Calculus with Starter	185	165
Calculus with Secondary	300	250
College Package	145	125

ORDER BLANK

Name:

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Package Name:	Cost
Program Names:	Cost $15/$25
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MATH SOFTWARE
1233 Blackthorn Pl.
Deerfield, IL 60015

Memory Size

INTRODUC

mde

PROGRAMS

INTERPRETIVE
EDUCATION
2306 Winters Dr.
Kalamazoo, MI 49002

PROGRAM BREAKTHROUGH

MCE programs are unique in that they interface established teaching principles with the latest computer technology to achieve a new level of educational excellence. MCE programs automatically individualize content by branching to the learner's own reading and comprehension levels. Only Interpretive Education offers this advanced branching procedure as one of the key aspects of its microcomputer educational model, **a model to set the industry standard.** The MCE model assures that each program:

1. Provides content of interest using cognitive structures compatible with the learner's level of development.
2. Uses vocabulary in sentence structures that provide interest and is written so that the learner can independently read and understand the content.
3. Introduces the branching concept where learners by their responses determine the reading and comprehension levels at which they can be successful. Some programs provide learners with the choice of subject matter.
4. Includes supplemental materials and experiential suggestions for the teacher to reinforce concepts presented in the programs.
5. Supplies goals and behavioral objectives for all programs including error analysis on the results of assessment programs.

All MCE programs are cooperatively developed by a combined team of professional educators and microcomputer specialists. Each program is analyzed and evaluated by our team at every stage of development to guarantee program quality, educational effectiveness and conformity to the MCE model criteria. The MCE programs currently are available for application on the Apple II* — "Applesoft" 48K with disc drive and TRS-80** Model I, Level II 16K with cassette.

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*A trademark of Apple Computer, Inc.
**A trademark of Tandy Corporation

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LATEST MCE PROGRAMS — NOW AVAILABLE

The following MCE programs, which are geared to practical day-to-day living situations, are available now for ordering. For your convenience, an easy-to-mail order form is attached to the enclosed MCE program price list. If you prefer, place your order or request information concerning future programs by calling us collect at (616) 345-8681

INCOME MEETS EXPENSES

This program introduces students to the concept of budgeting by learning about income and its relationship to fixed and flexible expenses based on needs and wants.

YOU CAN BANK ON IT

This essential program introduces the concept of a bank. Through interaction with presentations on the banking services of checking and savings, the learner is provided opportunities to apply the newly acquired knowledge.

HOME SAFE HOME

This informative safety program highlights the major household hazards of fire, electrical shocks, falls and poisoning. Preventative suggestions are emphasized.

MONEY MANAGEMENT ASSESSMENT SERIES

This unique program assesses the basic skills needed to learn money management concepts and functions. The results when used for pre and post-testing will assist the teacher in the implementation and evaluation of money management programs, especially the MCE programs.

JOB READINESS — ASSESSMENT AND DEVELOPMENT

This innovative program combines the techniques of assessment and instruction in supplying the student with information to develop job readiness. It also provides the practical knowledge necessary for filling out applications and locating job placement agencies.

All MCE programs contain full supportive and supplementary materials for use by the instructor. This includes information on hardware usage, program content, instructional content, evaluations and supplemental materials. The MCE programs are designed to complement the teacher in the total educational process.

MCE PROGRAMS BY EDUCATORS FOR EDUCATORS!
ORDER YOUR MCE PROGRAMS TODAY!

PRICE LIST

JANUARY 1981

MICRO-COMPUTER HARDWARE:

Apple II with Applesoft, 48K and one disk drive *
TRS-80, Model I Level II, 16K and cassette **

POISON PROOF YOUR HOME	
Apple II	5 diskettes $210.00
TRS-80	5 cassettes, 2 sides $160.00
INCOME MEETS EXPENSES	
Apple II	8 diskettes $340.00
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Apple II	6 diskettes $245.00
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Includes 10 worksheets—20 of each	
HOME SAFE HOME	
Apple II	4 diskettes $165.00
TRS-80	4 cassettes, 2 sides $125.00
MONEY MANAGEMENT ASSESSMENT SERIES	
Apple II	4 diskettes $165.00
TRS-80	4 cassettes, 2 sides $125.00
JOB READINESS--ASSESSMENT AND DEVELOPMENT	
Apple II	4 diskettes $165.00
TRS-80	4 cassettes, 2 sides $125.00

[illegible]

BASIC SKILLS FOR SPECIAL NEEDS AUDIENCES

MCE ORDER FORM

I wish to order the following programs

Program #	Program Name

Purchase Order Number ____________ ☐ Complete if Canada

Name ____________

School ____________ Dept. ____________

School Address ____________ Phone ____________

City ____________ State ____________ Zip ____________

I agree to comply with the ordering policies and procedures of Interpretive Education. I will submit with an official purchase order.

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Signature

TYPEMASTER (COPYRIGHTED)

TYPEMASTER is an easy-to-use, interactive, computer program which helps beginning, advanced, or professional level typists improve their skills in a rapid and efficient manner. It adapts to the student's own learning needs based on automatically measured progress toward established speed and accuracy objectives. TYPEMASTER is written for the Apple II computer but can be rewritten for other systems.

TYPEMASTER is an interactive program which uses prestored reference drills which the student copies into the computer using its standard typewriter-type keyboard. On command by the student the appropriate reference drill is compared on a word-by-word basis with the student-generated drill text. The speed and accuracy are computed and words omitted, mistyped, misspelled, run together, or other, are displayed on a soft copy device, a picture tube, for viewing as soon as the drill is completed. They may also be listed on a typewriter output or line printer for permanent records or for use as new reference drill text to practice typing without the computer support --- that is, on a standard typewriter.

As soon as the student reaches or exceeds the set speed and accuracy objectives on any given drill, the computer program will promptly and automatically advance the student to the next drill in the sequence. Up to 98 drills can be used depending on the length of each drill. In a typical configuration, 10,000 words total of reference drill text can be stored. When all drills in a sequence are completed successfully, the student is automatically graduated to the sound of computer-generated music.

During the typing sessions the errors made are accumulated in the form of a special typing drill which is presented to the student automatically at appropriate intervals. Errors made during copying of this drill are accumulated for further drill formation with increased frequency of presentation of the problem keystrokes/words. The resulting second-level drill is then presented later for concentrated practice. These drills are also valuable for diagnostic use by the instructor and can be used as a guide for generating additional drills or other learning aids.

The instructor can use typing drills already on disc or type in new drills tailored to the individual student's needs at any time during the student training period. This is accomplished with a built-in text generation/word processor of the instructor portion of TYPEMASTER.

OTHER ADVANTAGES OF USING TYPEMASTER

1. Instructor work load is reduced
    - Grading papers is fully automatic and accurate.
    - Record keeping is automatic and complete.
    - Summary reports can be made automatically at any time.
    - Each student progresses at his own speed.
2. Instructional costs per student can be reduced
    - The number of students each instructor can handle is increased.
3. Diagnostic work is facilitated
    - The system highlights problem areas where special drills can be helpful.
4. Student progress is highly visible
    - Progress to date is available at any time.
    - Permanent record of progress is formed.
    - Each score on each drill attempt is recorded.
5. Students can progress faster
    - Time is not wasted typing material already learned.
    - Student is not embarrassed by a bad score
    - Drill is focused on the students' own problem areas.

TYPEMASTER 3.0 SOFTWARE $ 100

OPTIONAL HARDWARE:
- * PRINTER (CENTRONICS, TREND COM OR SILENTTYPE PREFERRED)
- * APPLESOFT II BASIC ROM PLUS CARD ($200) & PAYNOR LOWER CASE CHIP ($53) FOR BOTH UPPER AND LOWER CASE CAPABILITY

M.D. FULLMER & ASSOC.
1132 Via Jose, San Jose,
Calif. 95120

MECC SOFTWARE DISTRIBUTION BOOKLET: APPLE

This flyer will descibe the diskettes available from the Minnesota Educational Computing Consortium for the APPLE II™ microcomputer. To order these diskettes use the MECC PUBLICATIONS AND PROGRAMS PRICE LIST. Be sure you have a recent copy of this free information and ordering item.

Diskettes sold within the state of Minnesota are DOS 3.3. Diskettes sold out of the state of Minnesota are protected and use DOS 3.2.

All software is distributed on diskettes and designed to operate on a 32K APPLE II with Applesoft in ROM. Software requiring a printer can use APPLE's parallel, serial, or communications card.

MECC has a Non-Minnesota Educational Institutional Agreement Policy for the purchase of microcomputer courseware (diskettes and support booklets) which may be of interest to agencies or large school districts. Such an arrangement should be advantageous to institutional agencies supporting many microcomputers. If you would like more information on the institutional agreement contact the Director of Instructional Services Office at 612/376-1105.

APPLE II SOFTWARE AVAILABLE

1. *MECC APPLE DEMONSTRATION DISKETTE

   A sampling of the different kinds of applications available on the MECC diskettes is shown. The software demonstrates applications in drill and practice, tutorial, simulation, problem solving, and worksheet generation. Samples from music, science, social studies, industrial arts, reading and mathematics are provided.

2. *ELEMENTARY - VOLUME 1 (MATHEMATICS)

   The first elementary diskette contains programs to be used in the elementary mathematics classroom. Games of logic such as BAGELS, TAXMAN, and NUMBER, drill and practice programs, such as SPEED DRILL, ROUND, and CHANGE, and programs about the metric system such as METRIC ESTIMATE, METRIC LENGTH, and METRIC 21 are included on the diskette.

3. *ELEMENTARY - VOLUME 2 (LANGUAGE ARTS)

   The teacher can enter lists of spelling words in the computer and have them used by the program SPELL, which drills students on the spelling, MIXUP which presents the word in mixed up order, or WORD FIND, which will create a word find puzzle for the teacher to duplicate. If words and definitions are entered, a CROSS WORD puzzle can be generated or a WORD GAME can be played. Two other programs included on this diskette are TALK, a program designed to introduce students to the computer or AMAZING which prints out worksheet mazes. Several programs on this diskette use a printer.

4. *ELEMENTARY - VOLUME 3 (SOCIAL STUDIES)

The sell series, SELL APPLES, SELL PLANTS, SELL LEMONADE, and SELL BICYCLES which appears on the ELEMENTARY VOLUME 3 diskette can be used to teach elementary economics to students in grades 3 - 6. CIVIL will reinact battles of the CIVIL war while STATES and STATES2 provide drill and practice on the location of states in the U.S. and their capitals.

5. *ELEMENTARY - VOLUME 4 (MATHEMATICS AND SCIENCE)

Two mathematics programs ESTIMATE and MATHGAME provide reinforcement on estimating and basic facts. Food chains in fish can be studied through ODELL LAKE while ODELL WOODS deals with food chains in animals. SOLAR DISTANCE teaches the concepts of distances in space and URSA provides a tutorial on constellations.

6. *MATHEMATICS - VOLUME 1 (SENIOR HIGH)

BAGELS, SNARK, ICBM, and RADAR will teach students logic while reinforcing the concepts of plotting points or angle measurements. ALGEBRA provides a drill and practice in solving equations. Three programs on the diskette can be used in plotting equations on a grid: SLOPE which is designed for use in ninth grade with linear functions, POLYGRAPH which will plot any equation on a rectangular coordinate system, and POLAR which graphs functions on polar coordinates.

7. *SCIENCE - VOLUME 3 (MIDDLE SCHOOL)

The FISH program through the use of low resolution graphics shows the circulatory system of a fish. Simulations like ODELL LAKE which is used to explore food chains, URSA which teaches about constellations, and QUAKES which simulates earthquakes are on the diskette. MINERALS can be used in the area of earth science to identify 29 minerals by having students perform simple tests.

8. SCIENCE - VOLUME 1 (SENIOR HIGH)

SCIENCE VOLUME 1 contains some of the programs which were developed through the Huntington II project: BUFFALO, an ecology program on controlling buffalo population, SLITS, a study of Young's double slit experiment, TAG, a simulation about fish tagging procedure, and CHARGE, a simulation of the Millikan oil drop experiment. WHALES, the simulation developed by San Diego schools about the whale migraton, DECAY1, a casino game to understand exponential decay and NEWTON2, a game to reinforce the concepts of vectors are also included. A printer is optional for some of the programs.

9. *SCIENCE - VOLUME 2 (SENIOR HIGH)

Many of the programs on this diskette were developed by Minnesota teachers. PEST, which deals with the use of pesticides, and CELL MEMBRANE which the user takes the part of a cell membrane, can be used in biology classes. SNELL plots light refraction demonstrating SNELL's law while COLLIDE simulates the collision between two bodies. DIFFUSION deals with the diffusion rates of various gasses, NUCLEAR SIMULATION shows radioactive decay of nine different radioisotopes, ICBM and RADAR teach angles and projections on a coordinate system.

10. SOCIAL STUDIES - VOLUME 1 (SENIOR HIGH)

SOCIAL STUDIES VOLUME 1 contains some of the programs that were developed by Huntington II: LIMITS which is a simulation of the resources in the world of the future; the election series, ELECT1, ELECT2, ELECT3 which simulates presidential elections, POLICY, which simulates the impact of special interest groups on policy information and USPOP which projects U.S. population. ENERGY and FUTURE developed at N.W. Regional Lab deal with the issues of energy supplies in the future. A printer is optional for some of the programs.

11. *SOCIAL STUDIES - VOLUME 2 (SENIOR HIGH)

Four programs on this diskette are drill and practice programs: STATES and STATES2 which deal with the U.S. states and capitals, COUNTRY which identifies the capital of various countries, and CONTINENT which identifies continents and countries. MINNAG allows users to explore factors in Minnesota agriculture. BARGAIN simulates the collective bargaining process while FAIL SAFE is a simulation on a nuclear war situation (based on the Fail-Safe book). CRISIS simulates a confrontation situation in Berlin and CRIMEX has the user control crime in a large city. A printer is optional for some of the programs.

12. MUSIC THEORY - VOLUME 1

The MUSIC programs work in the general areas of terminology and notation, rhythm, pitch, interval recognition, sight and sound, scales and chords. Eighteen programs are included in this series and use sound and graphics capabilities of the APPLE to demonstrate the musical concepts. (Volume 1 contains all programs that were previously on Volume 1 and Volume 2.)

14. BUSINESS - VOLUME 1

The business diskette contains programs to calculate interest and loans such as BANK which solves three types of bank problems, INTEREST, which compares simple to compound interest and LOANAM which prints loan amortizations tables. MANAGE is a simulation in which the teams of students compete against each other by running a business. MONEY tests users on monetary principles and PAYROLL simulates a payroll program. TYPING is another program included on the diskette which gives users practice in improving their typing speed.

15. *TEACHER UTILITIES - VOLUME 1

The TEACHER UTILITIES diskette is designed to aid the teacher and would not be used by the student unless the teacher creates questions using the REVIEWLOAD program. This program allows the teacher to set up a list of questions which can be used either by the REVIEW program or the TEST GENERATOR program. The teacher can also make CROSS WORD puzzles, WORD FIND puzzles, BLOCK LETTER banners and POSTERS using this program. FREQUENCY and PERCENT can be used to calculate grades and do statistical analysis. A printer is needed for some of the programs on this diskette.

16. *AESTHEOMETRY - VOLUME 1

AESTHEOMETRY deals with the topic of curve sketching by introducing and demonstrating the "space concepts" of elliptical, parabolic and hyberbolic curves. Curve sketching designs are developed to provide an aesthetic view of geometric shapes.

17. AGRICULTURE - VOLUME 1

The AGRICULTURE diskette contains five programs, AGCROP which analyzes crop data, BEEFBUY which provides cost and cash return, CUSTOM which aids in deciding between alternative cropping choices, MINNAG which lets the user explore factors related to Minnesota agriculture, and TRACTOR which performs computations needed to figure the cost of owning a tractor.

18. DRIVER'S EDUCATION/INDUSTRIAL ARTS - VOLUME 1

Two DRIVER EDUCATION programs prepare students to take the Minnesota Driver permit test. Three additional programs work in the area of industrial arts with MICROMETER graphically drilling the students on using a micrometer and RAFTER and STAIRS doing the calculatons needed to build a rafter in a building and stairs in a home.

19. *ELEMENTARY - VOLUME 5 (LANGUAGE ARTS)

ELEMENTARY - VOLUME 5 deals with the reading concept of prefixes. The diskette contains five lessons which both teach and practice the prefixes of UN, RE, DIS, PRE, and IN. Two review drills, DRAGON FIRE and PRE - APP II, are also contained on the diskette.

20. *PROGRAMMER'S AID - VOLUME 1

The PROGRAMMER'S AID diskette provides help for the programmer. Programs to be able to UPLOAD and DOWNLOAD to the MECC system, programs that work with text files including FP TO TEXT, RANDOM EDITOR, SEQUENTIAL EDITOR, and TEXT LIST along with programs to work with binary files, BINARY FILE INFO, BINARY FILE TO FP are included. Two programs TABLES and MERGE allow the user to create, change and merge graphic shapes for use in a program. FREE SPACE will tell the amount of space on the diskette while HIDDEN CHARACTERS will located control characters. STARTER will put standard routines such as space bar, music, graphic characters or input into a user's program which is just being created or already created.

21. *MICAS - VOLUME 1

Microcomputer Integrated Computerized Accounting System requires dual disks and 132 characters width printer. The MICAS computerized accounting system provides a realistic experience with automated accounting systems. The package consists of four integrated systems: (1) general ledger, (2) accounts payable, (3) accounts receivable, and (4) inventory control.

22/23. CAM - VOLUME 1 and VOLUME 2

Comprehensive Achievement Monitoring requires 48K memory and Integer BASIC. Volume 1 uses the communication card while Volume 2 uses the parallel or serial card. The CAM system operating on the APPLE microcomputer provides computer processing support for monitoring students' progress on instructional objectives. The CAM student's function is to provide decision-making information to students, teachers, administrators, and parents. This function includes storing objectives and test forms, scoring student test responses, and generating reports indicating individual student and/or group performances on course objectives. Available out of Minnesota through: Hopkins Evaluation Center, Hopkins School District, Hopkins, Minnesota 55343.

24. ***SHAPE TABLES - VOLUME 1**

The SHAPE TABLES diskette includes 12 files of 187 shapes that can be incorporated in a user's program. Also included are all aids needed to work with shape tables.

25. *ELEMENTARY - VOLUME 6

Historical simulations, OREGON, VOYAGEUR and FURS are included in the ELEMENTARY - VOLUME 6 diskette. Along with these programs are NOMAD which teaches map reading and SUMER.

26. SPELLING - VOLUME 1 (PRIMARY)

Twenty spelling drills on frequently misspelled primary and intermediate words are included on this diskette. The teacher can also replace the words and sentences with their own.

27. *SPECIAL NEEDS - VOLUME 1 (SPELLING)

This diskette is designed to drill handicapped students on frequently misspelled primary and intermediate words. Students answer problems by either using the game buttons, the game turn knobs or any key on the keyboard.

28. SPELLING - VOLUME 2 (ADULT)

Thirty spelling drills on the most common misspelled adult words are included on this diskette. The teacher can change sentences to include new lists of words.

For more information on software refer to the MECC Publications and Programs Price List or contact MECC Publications, 2520 Broadway Drive, St. Paul, MN 55113 (612/376-1118).

MECC PUBLICATIONS AND PROGRAM PRICE LIST

PLEASE INDICATE QUANTITY AND CIRCLE STOCK NUMBER

MECC TIMESHARE SYSTEM
MINNESOTA DEVELOPED TIMESHARE PROGRAM SUPPORT BOOKLETS

NUM.	PROGRAM SUPPORTED	PROGRAM TOPIC	QUAN	PRICE	TOTAL
101	ALGE	Algebra equation solving		$ .85	
105	BARGAIN	Collective bargaining-Student Booklet		$ .45	
106	BARGAIN	Collective bargaining-Teacher Booklet		$ .45	
110	BGAME	Business management game-Student Booklet		$ .55	
111	BGAME	Business management game-Teacher Booklet		$ .60	
115	CELLM	Cell membrane functions		$ .95	
117	CHEM	Conquering basic chemistry skills		$ 1.95	
120	COMCRIM	Computer related crime		$ 2.50	
125	DUAL	Art language-User Manual		$ 1.50	
130	ENRPRO	Enrollment projection		$ .45	
135	HARLIE,ANIMAL	Intelligent computers		$ 2.35	
140	HEALTH	Life assessment-Student Booklet		$ 1.10	
145	HEALTH	Life assessment-Teacher Booklet		$ 1.40	
150	INTRVAL,SCALE	Music theory		$ 1.40	
155	MNIRAP	Readability tests		$ .60	
160	MINITAB	Social science applications of MINITAB		$ 1.60	
165	MISSIS	Statistics		$ 4.00	
170	MCIS	Minnesota career information-Student Booklet		$ .15	
171	MCIS	Minnesota career information-Teacher Booklet		$11.00	
180	NUCSIM	Nuclear decay		$ 1.70	
185	ODELL1	Odell lake food chain		$ .60	
190	ODELL2	Odell woods food chain		$ 1.00	
200	OREGON	Westward movement of U.S. pioneers		$ .85	
205	PEOPLE	Historical personalities		$ 1.25	
210	PEST	Pest control		$ .50	
215	PSEUDO3	Experiments in psychology		$ 1.00	
220	QUAKES	Study of earthquakes		$ .85	
225	RHYTHMS	Biorhythm analysis		$ 1.60	
230	SALARY	Salary schedule projection		$ .45	
235	SAFE	Nuclear war situation		$ 1.40	
240	SELLA,SELLB SELLL,SELLP	Elementary school economics		$ 1.90	
245	SPANISH	Spanish grammar		$ 2.40	

MINNESOTA DEVELOPED TIMESHARE CURRICULUM BOOKLETS

(Booklets for multiple programs or major curriculum packages)

NUM.	SUBJECT	TITLE	QUAN	PRICE	TOTAL
300	Agriculture	Agriculture Decisions Aids		$ 3.75	
305	Athletics	Sports Documentation		$ 3.50	
310	Elementary	Elementary My Dear Computer		$16.30	
315	Home Economics	Nutrition booklet		$ 3.85	
320	Mathematics	(CGMM) Computer Generated Math Materials		$10.00	
325	Mathematics	(COMPUTE) Arithmetic worksheet generator-Teacher Booklet		$ 6.60	
330	Mathematics	(MATH) Arithmetic drill and practice		$ 2.20	
335	Social Studies	Guide To Social Science Applications		$15.00	

NUM.	PROGRAM SUPPORTED	PROGRAM TOPIC	QUAN	PRICE	TOTAL
400	ALGEBRA	Algebra Drill and Practice (Conduit)		$ 4.40	
401	CALCUL	Calculus and Computer - Student (Conduit)		$ 7.70	
402	CALCUL	Calculus and Computer - Teacher (Conduit)		$ 2.50	
406	TCHINC	Critical Incidences in Educ.-Teacher (Conduit)		$ 2.20	
407	TCHINC	Critical Incidences in Educ. - Student (Critical)		$ 2.20	
408	ECOLMOD	Ecological Modeling (Conduit)		$ 4.40	
410	ENERGY	Energy Simulation - Student (NW Regional Lab)		$ 2.15	
411	ENERGY	Energy Simulation - Teacher (NW Regional Lab)		$ 2.00	
415	FUTURE	Future use of energy-Student(NW Regional Lab)		$ 2.05	
416	FUTURE	Future use of energy-Teacher(NW Reg. Lab)		$ 2.25	
420	GIS	80-81 Guidance Info. Sys.-Student (TSC)		$ 1.10	
421	GIS	80-81 GIS Update - Teacher (TSC)		$20.00	
430	MKTACT	Marketing in Action - Student (Conduit)		$ 6.60	
432	MOTION	Interactive Methods In Physics+Math (Colorado)		$ 4.60	
435	MINTAB	MINITAB Student Handbook (Penn State Univ)		$ 8.65	
436	OPRMGT	Computer Model In Operation Mgt. (Conduit)		$ 7.70	
440	WHEELS	Car Buying Simulaton (Amidon Corporation)		$ 2.10	

COMPUTER AWARENESS MATERIALS

NUM.	DESCRIPTION	QUAN	PRICE	TOTAL
500	Mn. Computer Literacy Assessment-Form 8		$ .75	
501	Final Report-Computer Literacy Study (MECC)		$11.00	
505	History of Computing (MECC)		$ 1.40	
510	Are You Computer Literate? (Dilithium Press)		$ 4.50	
515	What Is A Computer? (Houghton Mifflin)		$ 3.85	

MINNESOTA DEVELOPED PROGRAMMING MANUALS

NUM.	DESCRIPTION	QUAN	PRICE	TOTAL
520	New User's Guide To MECC Timeshare System		$ .35	
525	Quick Reference Guide to CDC/CYBER 73		$ .15	
530	Intro. To MECC Timeshare BASIC - Student		$ 3.10	
531	Answer Key - Intro. To MECC		$ 1.25	
540	Introduction to BASIC Files		$ 1.40	
545	BASIC Language Workbook		$ 1.70	
546	BASIC,Minnesota		$ 6.05	
548	HYCOMP - A Lower Level Language		$ 1.50	

OTHER TIMESHARE PROGRAMMING REFERENCE MANUALS

NUM.	DESCRIPTION	QUAN	PRICE	TOTAL
550	NOS T/S Users Manual -CDC 60435500		$ 7.20	
551	NOS 1.5 Reference Manual Vol.1-CDC60435400		$15.85	
552	NOS 1.5 Reference Manual Vol.2-CDC60445300		$14.90	
553	NOS Terminal Users Ins.-CDC60435800		$ 1.90	
554	NOS Application Program.Ins. - CDC6043600		$ 2.10	
564	ALGOL Reference Manual V4 -CDC60384700		$14.00	
566	APL Reference Manual V2 -CDC 6045400		$ 8.15	
568	BASIC Reference Manual V3 -CDC 19983900		$ 8.55	
571	COBOL V5 Reference Manual - CDC 60497100		$19.50	
572	COMPASS Reference Manual V3- CDC60360900		$10.55	
576	FORTRAN V5 Ref. Manual -CDC60431300		$12.60	
580	PASCAL Intro. To Methodical Programming		$10.80	
582	SNOBOL Reference Manual		$12.65	
590	CALLS Programming Manual		$ 1.80	
592	XEDIT Users Info. Manual - CDC7607100		$ 4.00	
594	XEDIT Writeup Summary		$ .75	

APPLE II MICROCOMPUTER PUBLICATIONS/DISKETTES

NUM.	MICROCOMPUTER PUBLICATIONS	QUAN	PRICE	TOTAL
600	First Book of Microcomputers (Hayden)		$ 4.95	
605	Study of Micros In Administration (MECC)		$ 5.00	
606	1979-80 Microcomputer Report (MECC)		$10.00	
615	Applesoft Basic Prog. Ref. (Apple Computer)		$ 8.00	
620	Quick Reference Manual to Applesoft (TIES)		$ .25	
625	Apple New User's Guide (MECC)		$ 1.25	
630	Authoring Guide (MECC)		$ 5.00	

APPLE II DISKETTES AND SUPPORT BOOKLETS

NUM.	TITLE		QUAN	Minnesota PRICE	Non-Minnesota PRICE**	TOTAL
701	*MECC SOFTWARE DEMO	Diskette		$ 9.00	$15.00	
702	*ELEMENTARY VOL 1	Diskette		$ 9.00	$15.00	
902		Support Booklet		$ 3.20	$ 3.20	
703	*ELEMENTARY VOL 2	Diskette		$ 9.00	$15.00	
704	*ELEMENTARY VOL 3	Diskette		$ 9.00	$15.00	
705	*ELEMENTARY VOL 4	Diskette		$ 9.00	$15.00	
905		Support Booklet		$ 4.15	$ 4.15	
706	*MATHEMATICS VOL 1	Diskette		$ 9.00	$15.00	
707	*SCIENCE VOL 3	Diskette		$ 9.00	$15.00	
708	SCIENCE VOL 1	Diskette		$ 9.00	N.A.	
709	*SCIENCE VOL 2	Diskette		$ 9.00	$15.00	
710	SOCIAL STUDIES VOL 1	Diskette		$ 9.00	N.A.	
910		Support Booklet		$ 2.75	$ 2.75	
711	*SOCIAL STUDIES VOL 2	Diskette		$ 9.00	$15.00	
712	MUSIC THEORY VOL 1	Diskette		$ 9.00	N.A.	
714	BUSINESS VOL 1	Diskette		$ 9.00	N.A.	
914		Support Booklet		$ 2.20	N.A.	
715	*TEACHER UTILITIES VOL 1	Diskette		$ 9.00	$15.00	
716	*AESTHEOMETRY VOL 1	Diskette		$ 9.00	$15.00	
717	AGRICULTURE	Diskette		$ 9.00	N.A.	
718	DRIVER'S EDUC. VOL 1	Diskette		$ 9.00	N.A.	
918		Support Booklet		$ 1.15	$ 1.15	
719	*ELEMENTARY VOL 5	Diskette		$ 9.00	$15.00	
919		Support Booklet		$ 3.00	$ 3.00	
720	*PROGRAMMER'S AID VOL 1	Diskette		$ 9.00	$15.00	
721	*MICAS VOL 1	Diskette		$ 9.00	$15.00	
921		Support Booklet		$ 8.50	$ 8.50	
722	CAM VOL 1	Diskette		$ 9.00	N.A.	
922		Support Booklet		$ 2.35	$ 2.35	
723	CAM VOL 2	Diskette		$ 9.00	N.A.	
	(same as 922)	Support Booklet		$ 2.35	$ 2.35	
724	*SHAPE TABLES VOL 1	Diskette		$ 9.00	$15.00	
725	*ELEMENTARY 6	Diskette		$ 9.00	$15.00	
726	SPELLING VOL 1	Diskette		$ 9.00	N.A.	
727	*SPECIAL NEEDS VOL 1	Diskette		$ 9.00	$15.00	

998 MECC Software Distribution Procedure Booklet: Timeshare (no charge) ______

999 MECC Software Distribution Booklet: Apple (no charge) ______

Additional courseware will become available during the fall. A new [illegible]
upon request October 15.

N.A. = Not Available
-N- = New Additions To MECC Publications

Conduit manuals available through:
Conduit
P.O. Box 388
Iowa City, Iowa 5224

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Payments must be made in U.S. dollars.

[illegible] All orders are final — No Returns

* Effective May 1, 1978 the price of each item on this price list includes distributing and handling costs for Minnesota customers. Non-Minnesota customers are charged a 33 percent surcharge to cover MECC Publications operating cost normally paid by MECC member institutions. (This includes diskettes.)

Specific information regards courseware available for timeshare users and the contents of the available Apple II diskettes can be obtained from the two publications numbered #998 and #999.

EDUCATIONAL SOFTWARE FOR MICROCOMPUTERS

guided drill, practice and instruction in mathematics computer literacy language arts science

MENTOR SOFTWARE, INC.
THE SOFTWARE FACTORY
P.O. BOX 791
ANOKA, MINNESOTA 55303

The following well supported packages are available for your 8K PET 2001, 4K and 16K TRS-80 Level II, and 32K APPLE II with ROM Applesoft.

INTRODUCTION TO MICROCOMPUTERS

The National Council of Supervisors of Mathematics has defined computer literacy as one of the ten basic skills to be taught in today's mathematic's classrooms. INTRODUCTION to MICROCOMPUTERS is designed to help students acquire the keyboard skills, knowledge of computer terminology and computer components necessary for survival in a society increasingly influenced by computers. Six programs plus a teacher's guide. Elementary — Jr. High

TRS—80 Cassettes	$54.95
PET Cassettes	$54.95
APPLE II Diskette	$54.95

MATH SKILL GAMES-REGROUPING

Regrouping or renaming skills involving addition and subtraction can cause difficulties for many students. The programs in MATH SKILL GAMES—REGROUPING provide your students with drill and practice in regrouping concepts and you with the information to identify levels at which they are experiencing difficulty. The drill programs use graphics to promote learning success. Ten programs plus a teacher's guide. Elementary-Junior High.

TRS-80 Cassettes (16K)	$79.95

MATH WORD PROBLEMS

Solving word problems is a difficult task for young children. MATH WORD PROBLEMS provides them with a technique for solving these problems and illustrations of problems to be solved. The student determines the correct operation, translates verbal statements into mathematical sentences and solves the problem. The reading level has been controlled at or below the level of mathematical content. Six programs plus a teacher's guide. Elementary

TRS—80 Cassettes	$54.95
PET Cassettes	$54.95
APPLE II Diskette	$54.95

MILLIKAN

The Millikan oil drop experiment is frequently omitted in high school and college physics courses due to time, cost and complexity of equipment. Using this package, your students can simulate the Millikan experiment and thereby gain a better understanding of the physical concept involved. Students can actually watch and control the drops as they move between the charged plates on the screen. Package includes user's guide. High School-College.

APPLE II Diskette	$19.95

TITRATION

TITRATION simulates typical acid-base titrations as they are performed in high school and college chemistry courses. The student is presented with either a basic or acidic solution of unknown normality. The titration process can be controlled and observed on the screen. Ideal for pre-lab preparation, post-lab discussion or demonstration. Package includes user guide materials. High School-College

APPLE II Diskette	$19.95

BASIC MATH SKILL GAMES

Do your students have problems with addition, subtraction, multiplication or divisions? If your answer is yes, BASIC MATH SKILL GAMES is designed for your classroom use. The programs present drill and practice at three different levels of problem difficulty. Certain programs are designed to increase speed while others develop accuracy. All programs combine graphics with gaming techniques that encourage students to drill and practice. Twelve programs plus a teacher's guide. Elementary — Jr. High

TRS—80 Cassettes	$94.95
PET Cassettes	$94.95
APPLE II Diskette	$94.95

SPELLING I

SPELLING I drills pupils on sixty of the most common sight words found in primary readers. Included are words that follow no special spelling rules and are problems for beginning spellers. The programs combine computer display and the spoken word via the cassette tape recorder. The child HEARS the word used in a sentence at the same time the sentence, minus the spelling word, appears on the screen. The student then types in the missing word. Six programs plus a teacher's guide. Elementary

TRS-80 Cassettes	$59.95
APPLE II Diskette (Tape Activator Required)*	$59.95

SPELLING II

SPELLING II drills pupils on sixty of the most common sight words found in reading series for primary grades. Among these words are those with irregular spelling for which no special rules apply. The programs combine computer display and the spoken word via the cassette tape recorder. The child HEARS the word used in a sentence at the same time the sentence, minus the spelling word, appears on the screen. The student then types in the missing word. Six programs plus a teacher's guide. Elementary

TRS-80 Cassettes	$59.95
APPLE II Diskette (Tape Activator Required)*	$59.95

U-SPELL

U-SPELL allows the teacher to create an audio enhanced spelling drill. The desired spelling word and sentence are entered into a computer program. The sentence is also orally recorded on the tape recorder. When using the program, the child HEARS the word used in a sentence and then SEES the sentence, minus the spelling word, on the screen. The missing word can then be entered. Two lesson preparation programs plus blank tapes.

TRS-80 Cassette	$34.95
APPLE II Diskette (Tape Activator Required)*	$34.95

*The tape activator plugs into the GAME I/O on the Apple II and starts and stops audio tape recorders via the REMOTE jack. A tape activator is available from Mentor Software for $39.95.

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ORDERING INFORMATION

Educational Institutions. Terms Net in 30 days. Shipping and handling charges of 5% will be added to your invoice. MENTOR SOFTWARE, Inc. will pay shipping and handling on all prepaid orders. Name of computer system must accompany order.

Individuals: Payment must accompany your order. When you have computed the total add 5% for shipping and handling. Minnesota residents add 4% sales tax.

SHIPPING INFORMATION

Orders will be shipped 3-5 days after receipt. Items temporarily out of stock will be backordered and shipped as soon as available.

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	QTY.	COMPUTER SYSTEM	ITEM DESCRIPTION	PRICE	TOTAL
ORDER FORM					

APPLE II (Available on disk only)

ELEMENTARY MATH PACKAGE I (24.95) APPLESOFT ED 050

PLACE VALUE	Introduces the basic concepts of the decimal number system and place value with graphic illustrations. Includes drill and practice on place value. Order number ED1000
NUMBER STRINGS	Drill and practice program providing drills on addition of strings of numbers with the user providing the number of digits in each of the numbers and how many numbers will be in each string. Order number ED1001
MATH DRILL	Provides drills with graphics (and large numbers) in addition, subtraction, multiplication and division. You specify the type and number of problems with total control over level of difficulty. Order number ED1002
SPEED DRILL	Like MATH DRILL with 10 levels speed. ED1003

MICRO LEARNINGWARE
P.O. Box 2134
N. Mankato, MN 56001
507-625-2205

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****** TELLSTAR™ ******

PUT *** STARS *** IN YOUR APPLE

Is that Saturn in the Western sky? Jupiter? Aldeberan? Discover what you're really looking at with TellStar™. This High Resolution Graphics program responds interactively with the user via text and joystick (or game paddles) to locate, identify, and provide information on stellar objects. The program is easily used by children, enjoyed by adults, and a must for the amateur astronomer.

Designed for Apple II computers with 48K memories, Applesoft firmware card, Apple II Plus, or The Language System, and at least one disk drive, TellStar™ presents graphic displays for eight directions, as well as overhead, for any location on earth. Want to know what the skies look like at the North Pole, a South Sea Island, or your location? Let TellStar™ take you there in a matter of seconds.

The program accurately adjusts for latitude and longitude, viewing time and date, including the Earth's precession (or wobble). The right ascension and declination are provided for all objects in the tables, adjusted as indicated above.

Constellations, Planets, the Sun, Moon, and Stars are presented in High Resolution Graphic displays with several command modes available. A 'C' command connects constellation lines right before your eyes! You can learn the shape of Taurus, Leo, Cancer, and many more.

A 'P' command will print the view to a Silentype printer while an 'S' command can save the view for later recall. The 'L' command locates the object of your choice from star tables containing hundreds of interesting and easy to find stellar objects. TellStar™ next tells you what time the object rises and sets, the direction to look, and the object's brightness. This data can be printed on any printer.

Planets are easily located at 'your' time and location, information not obtainable from the 'static' planet finder charts. Planetary data are determined using Kepler's equations. Even Pluto with its highly eccentric orbit is accurately located, automatically.

Software for Music and Music Education

MUSIC COMPOSER™

AN APPLE II® compatible, low-cost music system designed by MMI for musicians and students. MMI Music software was designed by leading experts in music education and has been well tested in the classroom. A simple step-by-step instruction manual leads you through entering, displaying, editing, and playing music with up to four voices—soprano, alto, tenor, and bass. You can change the sound of each voice to reed, brass, string, or organ sounds and you can even color your own music sounds!

The MUSIC COMPOSER LETS YOU — — —

- 𝄞 **PLAY** up to 4 SIMULTANEOUS VOICES
- **SEE** all 4 VOICES at the same time you're HEARING the music—a must for music editing!
- **ENTER** music notes by a fast, simple and well-tested coding system, or through an easy graphic entry approach. The COMPOSER tells you when you've entered a wrong code and keeps track of rhythmic durations.
- **PROGRAM** the PITCH, RHYTHM, and TIMBRE of the music. The TEMPO is varied by the Apple paddle.
- **CHOOSE** 7 DIFFERENT TONE COLORS for each voice or CREATE YOUR OWN TONE COLOR.
- **COMPOSE**, EDIT, DISPLAY, and PLAY music through an interactive, command-driven language that's easy to learn.
- **SAVE** your MUSIC on disk.
- **HEAR** quality music sound at low cost through the MICRO MUSIC DAC card.
- **SELECT** from MMI music instruction software to accompany the MICRO MUSIC DAC.
- The MUSIC COMPOSER comes complete with an instruction manual, software disk, and the MICRO MUSIC DAC music card. Just plug the MICRO MUSIC DAC into the APPLE expansion slot and connect the audio cable to an 8 ohm speaker.

MMI
Micro Music Inc
213 Cambridge, Normal, IL 61761
(309) 452-6991

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MUSIC COMPOSER SPECIFICATIONS

PITCH

A 4-octave range of 25 equal-tempered chromatic steps (65.1 Hz to 1046.5 Hz).

RHYTHM

The rhythmic durations are whole, half, quarter, eighth, sixteenth, and thirty second notes and their dotted values.

CODING SYSTEM

A literal music code is used. For example, .HGS2 is a dotted half note, G-sharp in the second octave. A QR is a quarter rest. The software checks all input for legal codes.

VOICES

Music with 1, 2, 3, or 4 polyphonic voices may be entered into the COMPOSER.

MUSIC ENTRY SYSTEMS

GRAPHIC entry for non-musicians (notes to be entered are selected from visual "menus" on the screen), and LITERAL code entry (.HGS2 is a dotted half-note, G sharp in the second octave. QR is a quarter rest).

TEMPO

Tempo of the music is controlled by the APPLE Paddle #0.

TIMBRE

The COMPOSER has 7 preset timbres: rich string, wind-flute, brass, oboe-bassoon, clarinet, electronic organ, and funky oboe. The COMPOSER provides features for constructing and saving your own timbres.

FOURIER CONSTRUCTION

Timbres may be easily constructed, visualized and heard by assigning a relative strength to each harmonic within a tone. Limited to 16 harmonics and restricted to frequencies below 5 KHz.

COMMANDS

The COMPOSER is command-driven. The double-question mark, ??, is the prompt for a command. The single-question mark, ?, is the prompt for data. The commands available are PLAY, DISPLAY (and play), COMPOSE, EDIT, FOURIER, VOICES, METER, TIMBRE, READ, WRITE, HELP, and QUIT.

EDITING

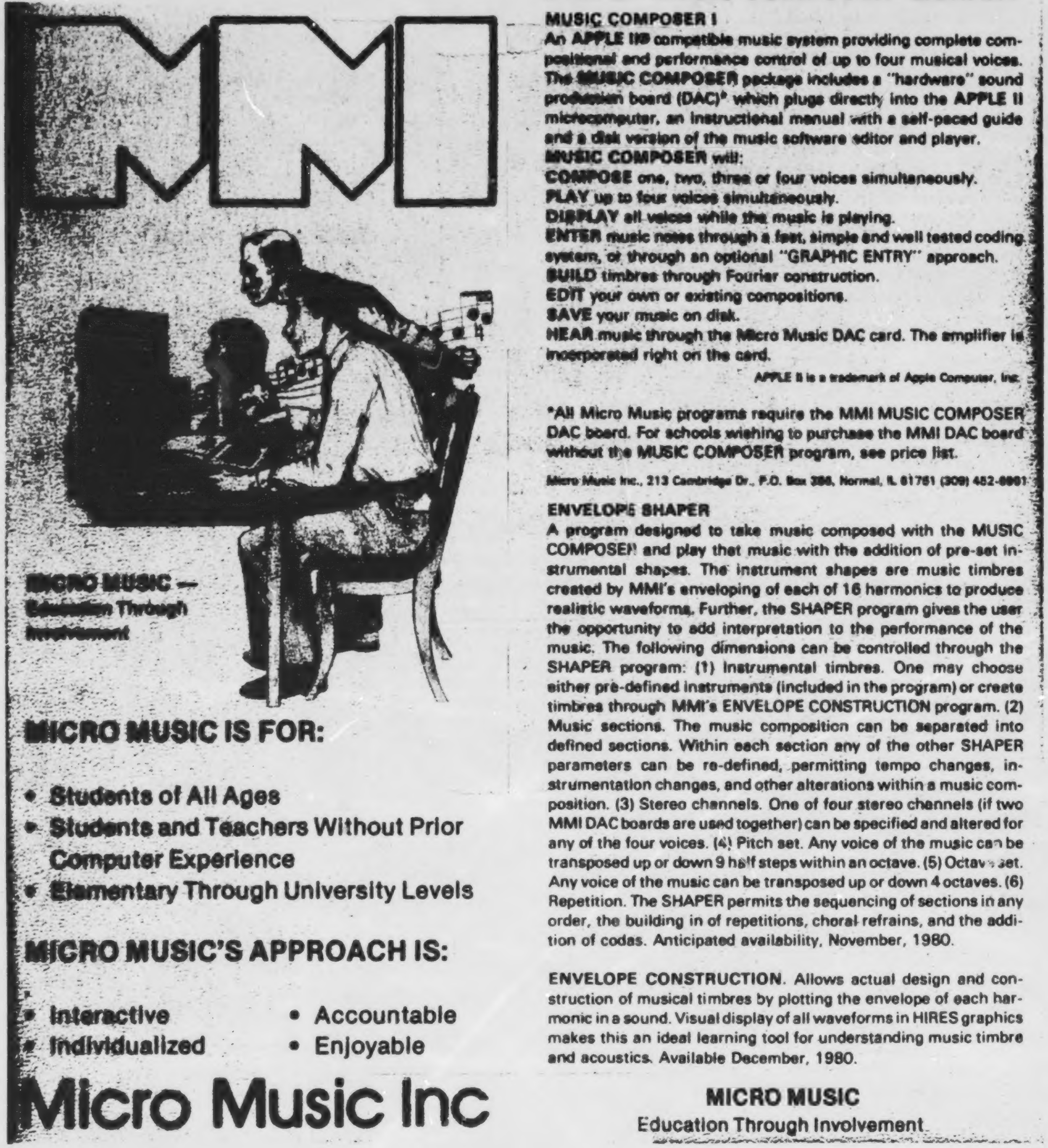
The COMPOSER permits quick editing of any set. In the edit mode the stored music set is displayed as well as the new music set being entered. The button on the APPLE Paddle #0 lets you stop and start the music at any point. With the button depressed, pushing the space bar on the keyboard returns you to command mode. This feature gives you great flexibility in composing, playing, displaying and editing. The display mode is provided only for the purpose of editing and is not recommended for final performance of music.

MICRO MUSIC DAC BOARD

This digital-to-analog converter permits quality musical tones with a computer at low cost. Four simultaneous tones can be generated with this board and accompanying COMPOSER software. Tones are generated using a sampling technique and waveform tables stored in memory. The MICRO MUSIC DAC Board is required for all MICRO MUSIC programs.

MEMORY REQUIREMENTS

48K RAM.



MMI

MICRO MUSIC —
Education Through
Involvement

MICRO MUSIC IS FOR:

- Students of All Ages
- Students and Teachers Without Prior Computer Experience
- Elementary Through University Levels

MICRO MUSIC'S APPROACH IS:

- Interactive
- Individualized
- Accountable
- Enjoyable

Micro Music Inc

MMI'S "MUSIC COMPOSER" LIBRARY

MUSIC COMPOSER I

An **APPLE II®** compatible music system providing complete compositional and performance control of up to four musical voices. The **MUSIC COMPOSER** package includes a "hardware" sound production board (DAC)* which plugs directly into the **APPLE II** microcomputer, an instructional manual with a self-paced guide and a disk version of the music software editor and player.

MUSIC COMPOSER will:

COMPOSE one, two, three or four voices simultaneously.
PLAY up to four voices simultaneously.
DISPLAY all voices while the music is playing.
ENTER music notes through a fast, simple and well tested coding system, or through an optional "GRAPHIC ENTRY" approach.
BUILD timbres through Fourier construction.
EDIT your own or existing compositions.
SAVE your music on disk.
HEAR music through the Micro Music DAC card. The amplifier is incorporated right on the card.

APPLE II is a trademark of Apple Computer, Inc.

*All Micro Music programs require the MMI MUSIC COMPOSER DAC board. For schools wishing to purchase the MMI DAC board without the MUSIC COMPOSER program, see price list.

Micro Music Inc., 213 Cambridge Dr., P.O. Box 386, Normal, IL 61761 (309) 452-6861

ENVELOPE SHAPER

A program designed to take music composed with the MUSIC COMPOSER and play that music with the addition of pre-set instrumental shapes. The instrument shapes are music timbres created by MMI's enveloping of each of 16 harmonics to produce realistic waveforms. Further, the SHAPER program gives the user the opportunity to add interpretation to the performance of the music. The following dimensions can be controlled through the SHAPER program: (1) Instrumental timbres. One may choose either pre-defined instruments (included in the program) or create timbres through MMI's ENVELOPE CONSTRUCTION program. (2) Music sections. The music composition can be separated into defined sections. Within each section any of the other SHAPER parameters can be re-defined, permitting tempo changes, instrumentation changes, and other alterations within a music composition. (3) Stereo channels. One of four stereo channels (if two MMI DAC boards are used together) can be specified and altered for any of the four voices. (4) Pitch set. Any voice of the music can be transposed up or down 9 half steps within an octave. (5) Octave set. Any voice of the music can be transposed up or down 4 octaves. (6) Repetition. The SHAPER permits the sequencing of sections in any order, the building in of repetitions, choral refrains, and the addition of codas. Anticipated availability, November, 1980.

ENVELOPE CONSTRUCTION. Allows actual design and construction of musical timbres by plotting the envelope of each harmonic in a sound. Visual display of all waveforms in HIRES graphics makes this an ideal learning tool for understanding music timbre and acoustics. Available December, 1980.

MICRO MUSIC
Education Through Involvement

TUNING AND TEMPERAMENT CONSTRUCTION

Allows you to develop and listen to your own tunings, as well as examine all existing tunings and temperaments. Actually listen to and compare mean tone, equal tempered and other tunings in an aural as well as intellectual context. For the first time, the student can hear, visualize and compare differences and similarities. A must for study of the physics of sound.

MICRO MUSIC DIGISONG PAKS

Representative examples of American musical culture, preprogrammed by MMI. Available disks: Disco Rock & Jazz, Red Hot Bach, Oldies but Goodies (Barbershop), Dixieland Swingers, Hymn Favorites, Christmas Wonderland.

AUTO DIGISONG PLAYER

Enables pre-programming of timbre, tempo and other musical paramenters for fully automated performances of compositions.

EXPERIMENTER'S PACKAGE

Provides the educator or musician access to the machine language interpreter that produces MMI musical sound and graphics. It allows the programmer/teacher to tailor tutorial programs to the specific needs of his or her students! Designed for advanced programming applications.

Micro Music Inc.

- Affordable Computer Software for Music Education
- Educational Libraries for the Apple II Computer
- Music Synthesis for Music Performance

MMI'S "MASTER" LIBRARY

Programs written or selected for publication by Dr. David B. Williams and Dr. David L. Shrader with field testing at Illinois State University at Normal.

THE EAR TRAINING AND DICTATION SERIES

MELODIOUS DICTATOR

A program designed to teach students to hear single line melodies and to notate these melodies on a traditional treble clef staff. The student interacts with the computer, first listening to a melody, and then locating the pitches on a graphic representation of a keyboard. When a correct answer is given, a "Phaser" gun sounds and the note appears on the staff. If the answer is incorrect, a "beep" sounds and you are asked to try again. MELODIOUS DICTATOR automatically self-adjusts to the individual; when he or she is successful, the program systematically reduces the complexity of the patterns. (The easiest is a two note pattern based upon major and minor seconds). The computer continuously monitors each practice session.

RHYTHMIC DICTATOR

Teaches you to hear basic rhythmic patterns and to notate these patterns on a one line rhythmic staff. MMI has designed the program with all the flavor of a TV game while learning to improve your music ear. Rhythmic Dictator teaches basic skills of rhythmic dictation with rhythmic phrases which increasingly stress syncopation and rest values. Rhythmic Dictator self-adjusts to each individual's progress, continuously monitors each person's performance and provides a summary at the end of each practice session.

HARMONIOUS DICTATOR

An interactive approach to the perception of chords and chord structures within the same format as Melodious Dictator and Rhythmic Dictator, self-adjusting to each person's progress. Available February, 1981.

INTERVAL MANIA

Teaches both visual and aural identification of music intervals in a game context where one or two players can try to beat the clock by using skills of interval identification. Only three keys are needed for making your response from the video display. The program allows you to practice melodic and harmonic intervals with any combination of interval sizes and qualities (major, minor, diminished, augumented, and perfect), and practice in bass or treble clefs or the full great staff.

CHORD MANIA

Similar to Interval Mania, but designed to train the student's ear to understand and recognize chords. Available February, 1981.

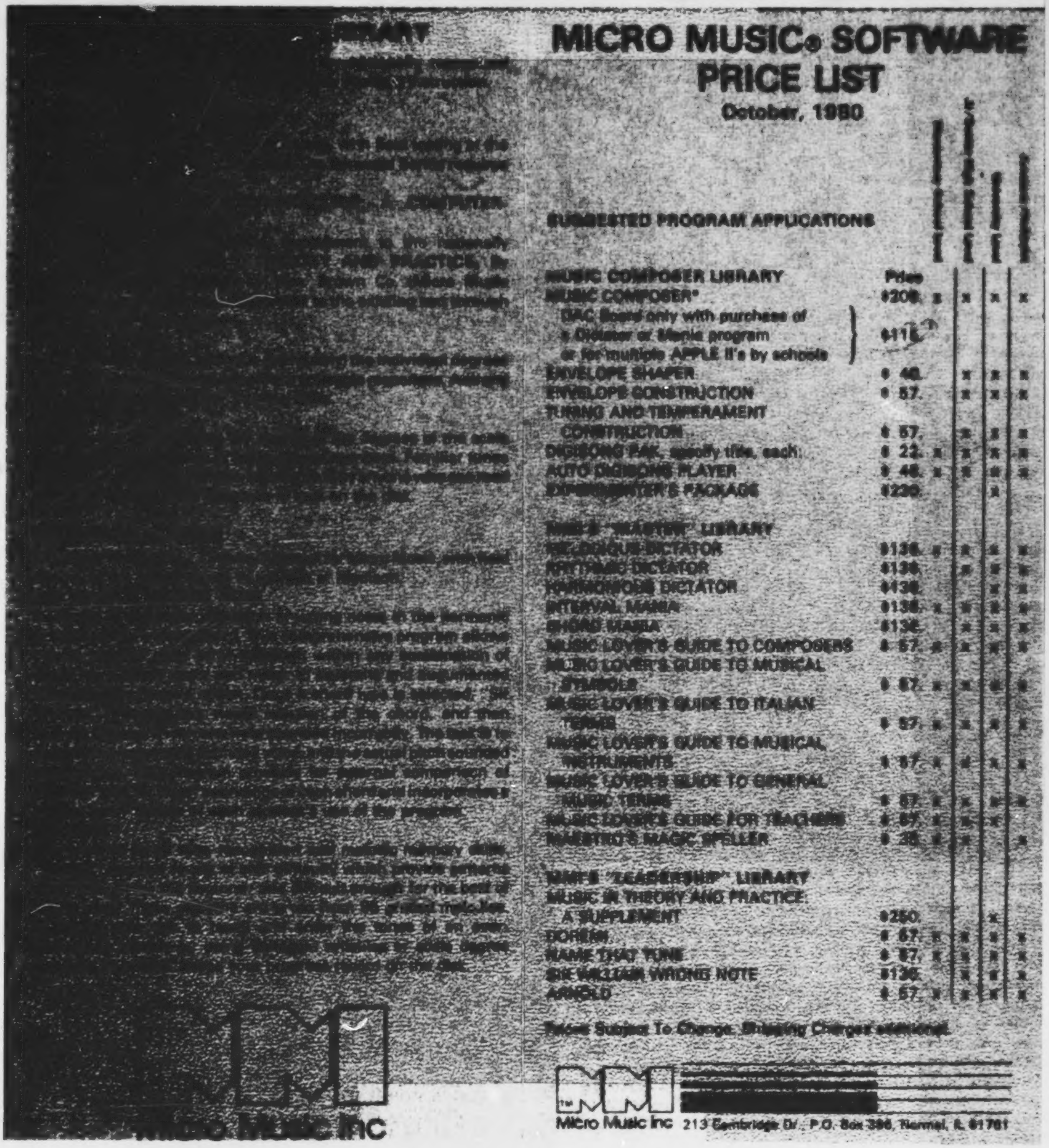
MUSIC LOVER'S GUIDES TO LEARNING SERIES

Spelling, recognition and recall of basic music information presented in a challenging, interactive format. Available February-March, 1981.

MUSIC LOVER'S GUIDE TO COMPOSERS
MUSIC LOVER'S GUIDE TO MUSICAL SYMBOLS
MUSIC LOVER'S GUIDE TO ITALIAN TERMS
MUSIC LOVER'S GUIDE TO MUSICAL INSTRUMENTS
MUSIC LOVER'S GUIDE TO GENERAL MUSIC TERMS
MUSIC LOVER'S GUIDE FOR TEACHERS: Allows the teacher to easily enter his or her own information into the "Music Lover's" program format. After the teacher enters the terms, the program presents these terms to the student for drill in identification, spelling and recall.
MAESTRO MAGIC SPELLER: Learn to spell musical terms, names, composers and symbols. The program self-adjusts to each student's ability; the more proficient they become, the more demanding the program becomes. An excellent program to acquaint intermediate age children with the standard typewriter keyboard.

(309) 452-6991

MMI™
Micro Music Inc 213 Cambridge Dr., P.O. Box 386, Normal, IL 61761



MICRO MUSIC® SOFTWARE PRICE LIST

October, 1980

SUGGESTED PROGRAM APPLICATIONS

	Price	[illegible]	[illegible]	[illegible]	[illegible]
MUSIC COMPOSER LIBRARY					
MUSIC COMPOSER*	$208.	x	x	x	x
DAC Board only with purchase of a Dictator or Mania program or for multiple APPLE II's by schools	$115.				
ENVELOPE SHAPER	$ 40.		x	x	x
ENVELOPE CONSTRUCTION	$ 57.		x	x	x
TUNING AND TEMPERAMENT CONSTRUCTION	$ 57.		x	x	x
DIGISONG PAK, specify title, each:	$ 22.	x	x	x	x
AUTO DIGISONG PLAYER	$ 46.	x	x	x	x
EXPERIMENTER'S PACKAGE	$230.			x	
MMI'S "MASTERY" LIBRARY					
MELODIOUS DICTATOR	$136.	x	x	x	x
RHYTHMIC DICTATOR	$136.		x	x	x
HARMONIOUS DICTATOR	$136.			x	x
INTERVAL MANIA	$136.	x	x	x	x
CHORD MANIA	$136.		x	x	x
MUSIC LOVER'S GUIDE TO COMPOSERS	$ 57.	x	x	x	x
MUSIC LOVER'S GUIDE TO MUSICAL SYMBOLS	$ 57.	x	x	x	x
MUSIC LOVER'S GUIDE TO ITALIAN TERMS	$ 57.	x	x	x	x
MUSIC LOVER'S GUIDE TO MUSICAL INSTRUMENTS	$ 57.	x	x	x	x
MUSIC LOVER'S GUIDE TO GENERAL MUSIC TERMS	$ 57.	x	x	x	x
MUSIC LOVER'S GUIDE FOR TEACHERS	$ 57.	x	x	x	
MAESTRO'S MAGIC SPELLER	$ 35.	x	x		x
MMI'S "LEADERSHIP" LIBRARY					
MUSIC IN THEORY AND PRACTICE: A SUPPLEMENT	$250.			x	
DOREMI	$ 57.	x	x	x	x
NAME THAT TUNE	$ 57.	x	x	x	x
SIR WILLIAM WRONG NOTE	$136.		x	x	x
ARNOLD	$ 57.	x	x	x	x

Prices Subject To Change. Shipping Charges additional.

Micro Music Inc 213 Cambridge Dr., P.O. Box 386, Normal, IL 61761

Micro Music Inc

MICROPHYS PROGRAMS
2048 FORD STREET
BROOKLYN, NEW YORK 11229
(212) 646-0140

SOFTWARE SPECIALISTS **MICROPHYS PROGRAMS** SCIENCE AND EDUCATION
Mp

Dear Educator:

Microphys is pleased to introduce its series of computer programs which have been designed for use on Commodore PET/CBM and Apple II/Bell & Howell microcomputers. These programs have successfully enabled instructors to provide their students with an opportunity to review, in an interesting and effective manner, important concepts encountered in introductory courses in Chemistry, Physics, Calculus, Mathematics, Vocabulary and Spelling.

This vast array of educational software will readily enable you to use the microsystem in your courses as soon as it arrives. All programs are now available on cassette tape and arrive complete with full instructions for their immediate use, even by those who have little, if any, experience with the use of the computer itself.

Microphys has recently released an administrative software package which will provide, in a highly cost-effective and efficient fashion, daily and cumulative student attendance reporting; scheduling updates, including the generation of new class lists, student schedules, and add-drop forms; the maintenance of a mailing list/telephone directory dealing with both faculty and student groups. With the availability of the Commodore 8050 disk drive, Microphys will release its report card package which will maintain student cumulative records; generate class ranks and honor roll listings. This administrative software is presently only available for use with the PET/CBM. Those interested should write for additional details, sample print-outs, and arrange for a complete demonstration of the system's utility.

There are three types of programs in the Microphys educational series:

1. Computer-Assisted Instruction Programs: guide the student through a series of quantitative questions; the student interacts with the computer and receives immediate evaluation of his responses and/or assistance when needed. Each time a particular program is run, a different set of numerical data is generated. In most instances, an entirely different problem is presented.

2. Individualized-Instruction Programs: generate a unique set of problems for each student. The essential information needed to solve each of the problems is recorded and, when he is ready to do so, the student may obtain the computer's answers and compare his resolts. These answers may be suppressed by deleting line number 8500 in any of these individualized-instruction programs. When now run, a unique set of problems is still produced for each student who records the essential information along with his code number which is generated by the computer. When his work is completed, the student enters his code number and set of answers into the program which had given him his assignment. The computer will then grade his work, displaying the answers to those problems which were incorrectly solved; a percent score and a brief comment, reflecting an overall evaluation, are also given.

3. Utility Programs are designed to provide solutions to time consuming problems often given on exams and homework assignments. Problems in calorimetry, stoichiometry, projectile motion, vector analysis etc. require tedious computation. These utility programs free teachers from the time required to obtain the correct solutions. Students are usually permitted access to these programs in order to check their own work.

NOTE: each physics and chemistry program has both the computer-assisted instruction and individualized-instruction versions recorded on opposite sides of the cassette. The vocabulary programs are similarly designed, the computer assistance being rendered by providing the student with a sentence in which the word to be defined is used properly. With this contextual clue, the student is again asked to correctly define the word. The math cassettes have only an individualized mode designed to generate unique exams and homework assignments which may then be graded by the computer.

The cost of each cassette is $20 and the programs available for use on the PET/CBM and Apple II/Bell & Howell are listed in this catalog.

Microphys has released its educational software on floppy diskettes designed for use on the Apple/Bell & Howell and Commodore disk drive units. Each diskette is accompanied by complete instructions for those programs recorded upon it. The eleven diskettes presently available are listed below. The price of each diskette is $180.

1. P1: Physics I Diskette - contains the following programs: 1,2,3,4,5,6,7,8,9,10,301,302,305,306.
2. P2: Physics II Diskette - contains the following programs: 11,12,13,14,15,16,17,18,19,20,20A,21,35,36,40,303,304.
3. C1: Chemistry I Diskette - contains the following programs: 8,9,10,11,12,22,23,24,37,38,39,303,306.
4. C2: Chemistry II Diskette - contains the following programs: 25,26,27,28,29,30,31,32,33,34,307,308,309.
5. M1: Senior High Math I Diskette - contains the following programs: 701 - 713.
6. M2: Senior High Math II Diskette - contains the following programs: 714 - 725.
7. M3: Junior High Math Diskette - contains the following programs: 801 - 815.
8. M4: Calculus I Diskette - contains the following programs: 726 - 737.
9. V1: Senior High Vocabulary I Diskette - contains the following programs: 401 - 415.
10. V2: Junior High Vocabulary I Diskette - contains the following programs: 416 - 430.
11. S1: Junior/Senior High Spelling I Diskette - contains the following programs: 601,602,606,607,611,612,616,617,621,622,626,627.

NOTE: When ordering, please specify whether you wish to receive the Commodore PET/CBM or Apple II/Bell & Howell versions.

MICROPHYS PHYSICS AND CHEMISTRY PROGRAMS

PC1 **LINEAR KINEMATICS**
Generates a series of 5 questions dealing with linear motion and the analysis of a graph of instantaneous speed versus time.

PC2 **PROJECTILE MOTION**
Generates a series of 11 questions dealing with the analysis of a projectile in flight. The basic definitions of kinematics are thus reviewed.

PC3 **MOMENTUM AND ENERGY**
Generates a series of 11 questions dealing with the concepts of linear momentum, impulse, and kinetic energy.

PC4 **ENERGY AND THE INCLINED PLANE**
Generates a series of 10 questions dealing with the analysis of the motion of a particle on an inclined plane. The concepts of work, kinetic energy and potential energy are thus reviewed.

PC5 **INELASTIC COLLISIONS**
Generates a series of seven questions dealing with the analysis of an inelastic collision. The concepts of linear momentum and kinetic enregy are reviewed.

PC6 **CENTRIPETAL FORCE**
Generates a series of 6 questions dealing with the analysis of the motion of a particle undergoing uniform circular motion.

PC7 **PULLEY SYSTEM-MACHINES**
Generates a series of 7 questions dealing with the analysis of a pulley system consisting of single, double, or triple fixed and moveable blocks. The concepts of work and efficiency are thus reviewed.

PC8 **CALORIMETRY**
Generates a series of 4 questions dealing with the principle of calorimetry. The definition of specific heat capacity and the conservation of energy principle are thus reviewed.

PC9 **SPECIFIC HEAT CAPACITY**
Generates a series of 4 questions dealing with the definition of specific heat capacity.

PC10 **HEATS OF FUSION/VAPORIZATION**
Generates a series of 3 questions dealing with the concepts of fusion and vaporization.

PC11 **SPECIFIC GAS LAWS**
Generates a series of 3 questions dealing with gases undergoing isothermal, isobaric, and isovolumic processes. Thus, Boyle's, Charles', and Gay-Lussac's Laws are reviewed.

PC12 **GENERAL GAS LAW**
Generates a series of questions dealing with the behavior of a gas undergoing a general process in which all three thermodynamic variables may change.

PC13 **THERMODYNAMICS I**
Generates a series of 5 questions dealing with a confined gas which undergoes an isobaric process. The concepts of molar heat capacity, Charles' Lae, and the first law of thermodynamics are thus reviewed.

PC14	**THERMODYNAMICS II** Generates a series of 5 questions dealing with a confined gas which undergoes an isobaric compression during which a quantity of heat is removed.
PC15	**TRANSVERSE STANDING WAVES** Generates a series of 4 questions dealing with the study of the standing wave pattern established in a wire which is fastened at both ends.
PC16	**LONGITUDINAL STANDING WAVES** Generates a series of 4 questions dealing with the longitudinal wave pattern established in open and closed organ pipes.
PC17	**MIRRORS AND LENSES** Generates a series of 5 questions dealing with the image-forming properties of convex and concave mirrors and lenses.
PC18	**REFRACTION OF LIGHT** Generates a series of 3 questions dealing with the behavior of light rays striking a planar interface between two optical media.
PC19	**SERIES CIRCUIT ANALYSIS** Generates a series of 10 questions dealing with the analysis of a series circuit consisting of three resistors and a battery. The concepts of resistance, potential difference, and power are thus reviewed.
PC20	**PARALLEL CIRCUIT ANALYSIS I** Generates a series of 10 questions dealing with the analysis of a parallel circuit consisting of three resistors and a battery. The concepts of resistance, potential difference, and power are thus reviewed.
PC20A	**PARALLEL CIRCUIT ANALYSIS II** Generates a series of 6 questions dealing with the analysis of a parallel circuit consisting of three resistors and a battery. The concepts of resistance, potential difference, and Ohm's Law are thus reviewed.
PC21	**SERIES/PARALLEL CIRCUIT ANALYSIS** Generates a series of 6 questions dealing with the analysis of a circuit in which a single resistor is in series with a parallel combination of two resistors.
PC22	**FARADAY'S LAW** Generates a series of questions dealing with the analysis of an electrolytic solution.
PC23	**GRAM-MOLECULAR MASS** Randomly synthesizes inorganic compounds whose gram-molecular masses are to be determined. The writing of chemical formulas is also thus reviewed.
PC24	**THE MOLE CONCEPT** Generates a series of questions which deals with the mole concept and the writing of chemical formulas.
PC25	**THE MOLARITY CONCEPT** Generates a series of 3 questions dealing with the concept of molarity; the mole concept is also reviewed.
PC26	**THE NORMALITY CONCEPT** Generates a series of questions dealing with the concepts of gram-molecular mass, gram-equivalent mass, and normality.

PC27 **THE MOLALITY CONCEPT**
Generates a series of questions dealing with the concepts of gram-molecular mass and molality.

PC28 **STOICHIOMETRY: MASS/MASS**
Generates a series of questions which permits the development of facility in solving problems which involve mass/mass relationships in various chemical reactions.

PC29 **STOICHIOMETRY: MASS/VOLUME**
Generaltes a series of questions which permits the development of facility in solving problems which involve mass/volume relationships in various chemical reactions

PC30 **STOICHIOMETRY: VOLUME/VOLUME**
Generates a series of questions which permits the development of facility in solving problems which involve volume/volume relationships in various chemical reactions.

PC31 **STOICHIOMETRY: GENERAL**
Generates a series of questions dealing with stoichiometric relationships in chemical reactions. Mass/mass, mass/volume, and volume/volume problem types are randomly generated.

PC32 **PERCENT CONCENTRATION**
Generates a series of questions relating to the computation of the percent or fraction concentration of randomly generated solutions.

PC33 **pH CONCEPT**
Generates a series of questions dealing with the concept of pH and pOH. The student gains facility in working with logarithmic scales.

PC34 **EMF OF ELECTROCHEMICAL CELLS**
Generates a series of questions in which the student determines the EMF of a randomly synthesized electrochemical cell.

PC35 **ELECTRIC FIELD ANALYSIS**
Generates a series of 6 questions dealing with the work done in transferring a charged particle between two points in a uniform electric field.

PC36 **PHOTOELECTRIC EFFECT**
Generates a series of 4 questions dealing with the analysis of photoelectric emission from the surfaces of various randomly selected metallic cathodes.

PC37 **SYMBOLS AND VALENCES DRILL**
Students are given practice in learning the symbols and valences of the common ions and radicals encountered in elementary courses.

PC38 **NAMING COMPOUNDS DRILL**
Students are given practice in learning to name randomly synthesized compounds whose formulas are given.

PC39 **FORMULAS OF COMPOUNDS DRILL**
Students are given practice in learning to write the formulas of randomly synthesized compounds.

PC40 **TOTAL INTERNAL REFLECTION**
Generates a series of questions dealing with the reflection of light at appropriate interfaces.

MICROPHYS PHYSICS AND CHEMISTRY UTILITY PROGRAMS

PC301 **VECTOR ANALYSIS I**
Generates problems in which the student is asked to determine the magnitude and direction of the resultant of a concurrent system of three to five vectors.

PC302 **VECTOR ANALYSIS II**
This utility program is designed to determine the magnitude and direction of a system of concurrent vectors.

PC303 **GAS LAW ANALYSIS**
This utility program is designed to solve a large variety of problems in which gases undergo isothermal, isobaric, isovolumic, and general processes.

PC304 **OPTICS ANALYSIS**
This utility program is designed to solve a variety of problems involving the image forming properties of thin lenses and convex and concave mirrors.

PC305 **PROJECTILE ANALYSIS**
This utility program is designed to solve the general projectile motion problem. Time of flight, horizontal range, final velocity, and angle of impact are among the values determined.

PC306 **CALORIMETRY ANALYSIS**
This utility program is designed to solve the various time-consuming problems involved in the study of calorimetry. Substances undergoing changes in phase, as well as changes in temperature, may be dealt with by this problem.

PC307 **CHEMISTRY ANALYSIS I**
This utility program is designed to solve problems involving the mole concept and molarity.

PC308 **CHEMISTRY ANALYSIS II**
This utility program is designed to provide solutions to problems involving normality, molality, changes in freezing and boiling points of solutions.

PC309 **STOICHIOMETRIC ANALYSIS**
This utility program is designed to provide solutions to problems involving mass/mass, mass/volume, and volume/volume relationships in chemical reactions.

MICROPHYS VOCABULARY PROGRAMS

Each vocabulary program contains approximately 30 words which have been appropriately rated for a particular grade level. The list of words dealt with in a given program can be displayed by running that program from line number 8000.

Each time the program is run, the computer will randomly select 8 of the words and ask the student to:

Choose the most appropriate definition:

1. DISDAIN

   A. Quell
   B. Scorn
   C. Claim Falsely
   D. Estrange
   E. Observe

If the student responds incorrectly, the computer will indicate this and then advise the student that:

> The word **DISDAIN** is used properly in the following sentence:
>
> A moral individual would disdain the temptation of sin.

The computer then instructs the student to use this contextual clue and try again. A second incorrect response results in the student being informed of the correct answer. The student should be encouraged to work with a given cassette several times in order that he may ultimately be exposed to all the words and so that he may review sufficiently.

The instructor may wish to generate individualized exams and homework assignments. This may be done by running the vocabulary programs whose numbers are in the 500 series. Reference is directed to the general notes for all individualized-instruction programs.

NOTE: When PC401 is purchased, PC501, its individualized-instruction complement, is included on the opposite side of the cassette.

PC401	**Vocabulary I 12th Grade**	PC416	**Vocabulary I 9th Grade**
PC402	**Vocabulary II 12th Grade**	PC417	**Vocabulary II 9th Grade**
PC403	**Vocabulary III 12th Grade**	PC418	**Vocabulary III 9th Grade**
PC404	**Vocabulary IV 12th Grade**	PC419	**Vocabulary IV 9th Grade**
PC405	**Vocabulary V 12th Grade**	PC420	**Vocabulary V 9th Grade**
PC406	**Vocabulary I 11th Grade**	PC421	**Vocabulary I 8th Grade**
PC407	**Vocabulary II 11th Grade**	PC422	**Vocabulary II 8th Grade**
PC408	**Vocabulary III 11th Grade**	PC423	**Vocabulary III 8th Grade**
PC409	**Vocabulary IV 11th Grade**	PC424	**Vocabulary IV 8th Grade**
PC410	**Vocabulary V 11th Grade**	PC425	**Vocabulary V 8th Grade**
PC411	**Vocabulary I 10th Grade**	PC426	**Vocabulary I 7th Grade**
PC412	**Vocabulary II 10th Grade**	PC427	**Vocabulary II 7th Grade**
PC413	**Vocabulary III 10th Grade**	PC428	**Vocabulary III 7th Grade**
PC414	**Vocabulary IV 10th Grade**	PC429	**Vocabulary IV 7th Grade**
PC415	**Vocabulary V 10th Grade**	PC430	**Vocabulary V 7th Grade**

GENERAL NOTES FOR ALL MICROPHYS SPELLING PROGRAMS

Each spelling program contains 60 words which have been appropriately rated for a particular grade level. There will ultimately be 10 cassettes associated with each grade level. The format of each cassette is identical with that illustrated below.

A list of the words dealt with in a given program can be displayed by running the program from line 8000. This is accomplished by merely issuing the command:

RUN 8000 instead of simply RUN.

The teacher should display all 60 words and have the students define each word and construct sentences in which the words are used properly. The students should be encouraged to run (if available) the associated Microphys vocabulary programs in order to further reinforce learning.

Each time the program is run, the computer will randomly select 8 groups of five words. Any one of these five words may be spelled incorrectly. The student is then asked to:

```
Choose the word misspelled:

A. Disdane
B. Discern
C. Portray
D. Allude
E. Reprimand
```

If the student responds incorrectly, the computer will indicate this and ask the student to try again. A second incorrect response will result in the computer identifying the correct choice:

The word **Disdain** has been misspelled.

The student should be encouraged to work with a given cassette several times in order that he may ultimately be exposed to all words and so that he may review sufficiently.

The instructor may wish to generate individualized exams and homework assignments. This may be done by running the spelling programs whose numbers are in the 700 series. Reference is directed to the general notes for all individualized-instruction programs.

SPELLING PROGRAMS

PC601	Spelling I	Grade 12	PC616	Spelling I	Grade 9
PC602	Spelling II	Grade 12	PC617	Spelling II	Grade 9
PC606	Spelling I	Grade 11	PC621	Spelling I	Grade 8
PC607	Spelling II	Grade 11	PC622	Spelling II	Grade 8
PC611	Spelling I	Grade 10	PC626	Spelling I	Grade 7
PC612	Spelling II	Grade 10	PC627	Spelling II	Grade 7

MICROPHYS SENIOR HIGH SCHOOL MATHEMATICS PROGRAMS

PC701 QUADRATIC EQUATIONS
Enables the student to develop facility in solving quadratic equations.

PC702 TRIGONOMETRY I
Enables the student to develop facility in dealing with the definitions of the basic trig functions and in employing the law of sines and the law of cosines.

PC703 SIMULTANEOUS EQUATIONS (2x2)
Enables the student to develop facility in obtaining solutions to sets of two simultaneous linear equations.

PC704 SIMULTANEOUS EQUATIONS (3x3)
Enables the student to develop facility in obtaining solutions to sets of three simultaneous linear equations.

PC705 GEOMETRICAL AREAS
Enables the student to develop facility in determining the areas of various plane figures.

PC706 TRIGONOMETRY II
Enables the student to develop facility in dealing with the properties of a right triangle and the six basic trig functions: sine, cosine, tangent, cosecant, secant, and cotangent.

PC707 VERBAL PROBLEMS I - NUMBERS
Enables the student ot develop facility in dealing with the solution to verbal problems involving numerical relationships. The student must construct, from the statement of the problem, an algebraic equation which he then proceeds to solve for the unknown.

PC708 VERBAL PROBLEMS II - COINS
Similar to PC707. The problems involve numerical relationships among various United States coins.

PC709 VERBAL PROBLEMS III - AGES
Similar to PC707. The problems involve age relationships.

PC710 VERBAL PROBLEMS IV - INTEREST
Similar to PC707. The problems involve simple interest relationships.

PC711 VERBAL PROBLEMS V - MIXTURES
Similar to PC707. The problems involve mixture relationships.

PC712 VERBAL PROBLEMS VI - GEOMETRY
Similar to PC707. The problems involve simple geometric relationships.

PC713 VERBAL PROBLEMS VII - RATES
Similar to PC707. The problems involve rate relationships.

PC714 VERBAL PROBLEMS VIII - DIGITS
Similar to PC707. The problems involve relationships among the various digits of randomly generated numbers.

PC715 VERBAL PROBLEMS IX - WORK
Similar to PC707. The problems involve the rates at which work may be accomplished.

PC716 **ARITHMETIC PROGRESSIONS I**
Enables the student to develop facility in dealing with various arithmetic progressions. The common difference, nth term, and the number of terms are among the concepts being dealt with.

PC717 **ARITHMETIC PROGRESSIONS II**
Enables the student to develop facility in dealing with various arithmetic progressions. The common difference, nth term, and sum of an arithmetic progression are among the concepts being dealt with.

PC718 **GEOMETRIC PROGRESSIONS I**
Enables the student to develop facility in dealing with various geometric progressions. The common ratio, nth term, and geometric mean are three of the concepts being dealt with.

PC719 **GEOMETRIC PROGRESSIONS II**
Enables the student to develop facility in dealing with various geometric progressions. The common ratio, nth term, and sum of these progressions are among the concepts being dealt with.

PC720 **TYPES OF VARIATION**
Enables the student to develop facility in dealing with direct, indirect, and joint relationships.

PC721 **LINEAR EQUATIONS**
Enables the student to develop facility in dealing with the solution of simple linear equations for a single unknown.

PC722 **FORMULA EVALUATION**
Enables the student to develop facility in algebraically solving a randomly generated implicit relationship for some unknown variable.

PC723 **COORDINATE GEOMETRY**
Enables the student to develop facility in dealing with the elementary concepts of coordinate geometry. The distance between two points and the slope and intercept of a line passing through these points are among the concepts being dealt with.

PC724 **EXPONENTS AND LOGARITHMS**
Enables the student to develop facility in dealing with the definition of logarithmic equations and the use of exponents.

PC725 **VERBAL PROBLEMS X - GENERAL**
Similar to PC707 The problems involve various types of numerical relationships.

MICROPHYS INTRODUCTORY CALCULUS PROGRAMS

PC726	**DIFFERENTIATION ALGEBRAIC FUNCTIONS**
PC727	**MAXIMA/MINIMA PROBLEMS PART I**
PC728	**MAXIMA/MINIMA PROBLEMS PART II**
PC729	**RELATIVE RATES PROBLEMS PART I**
PC730	**RELATIVE RATES PROBLEMS PART II**
PC731	**INTEGRATION OF ALGEBRAIC FUNCTIONS**
PC732	**DIFFERENTIATION OF TRIGONOMETRIC FUNCTIONS**
PC733	**INTEGRATION OF TRIGONOMETRIC FUNCTIONS**
PC734	**INTEGRATION: AREAS OF PLANE FIGURES**
PC735	**INTEGRATION: VOLUMES OF SOLIDS**
PC736	**INTEGRATION: ARC LENGTHS**
PC737	**INTEGRATION: SURFACE AREAS OF SOLIDS**

Note: These programs may be purchased on cassette for $20 per program. The set of 12 Calculus programs is also available on Diskette M4 for $180.

MICROPHYS MAIL LIST/TELEPHONE DIRECTORY SYSTEM

Microphys is pleased to announce the development of a series of three programs which have been designed to permit the creation and maintenance of a mailing list/telephone directory for businesses, schools, clubs, organizations, etc.

The programs are intended for use with a 16K or 32K Commodore PET/CBM microcomputer system which should include the CBM 2040 dual disk drive and an interfacing printer which can accept mailing label stock.

The three programs are supplied on two pre-initialized diskettes and the system retails for $125. The system has a capacity to store about 3000 names, addresses and phone numbers. The programs are supplied with complete operating instructions and have been designed to enable the user having little computer experience to readily create and manage his own mailing/telephone system.

INDIVIDUAL PROGRAM DESCRIPTION

PC950	this program permits the entry of various names, addresses, phone numbers, and search codes. This data is stored in 52 diskette files which are dynamically created and updated by this program. The files are stored on Microphys diskettes L1 and L2 which have been properly initialized and are supplied with the system purchase.
PC951	this program permits the printing of address labels or the displaying of telephone numbers. Labels may be printed by zip code; by alphabet; by six-character search code; by telephone area code; without any sorting.
PC952	this program permits the updating of address entries. The program will modify or delete any of the various addresses stored in the 52 diskette files.

MICROPHYS JUNIOR HIGH SCHOOL MATHEMATICS PROGRAMS

PJ801 MAGIC SQUARES
The computer randomly generates 3x3 magic squares. The values of six of the nine elements will be displayed and the student is required to compute the values of the other 3 elements.

PJ802 MULTIPLICATION
Enables the student to develop facility in dealing with simple multiplication problems.

PJ803 DIVISION
Enables the student to develop facility in dealing with simple division problems. Two to seven digit integers may be involved.

PJ804 MODULAR ARITHMETIC
Enables the student to develop facility in dealing with addition, subtraction, and multiplication problems in randomly generated modular systems.

PJ805 PROPORTION PROBLEMS
Enables the student to develop facility in dealing with the solution of problems involving proportional relationships of the type: $X/a = b/c$

PJ806 PERCENT PROBLEMS
Enables the student to develop facility in dealing with the solution to verbal problems involving percent relationships.

PJ807 ADDITION OF FRACTIONS
Enables the student to develop facility in dealing with the addition of randomly generated fractions.

PJ808 SUBTRACTION OF FRACTIONS
Similar to PJ807 but involving subtraction.

PJ809 MULTIPLICATION OF FRACTIONS
Similar to PJ807 but involving multiplication.

PJ810 DIVISION OF FRACTIONS
Similar to PJ807 but involving division.

PJ811 MODE, MEDIAN, AND MEAN
Enables the student to develop facility in statistically analyzing a table of randomly generated data. The greatest, smallest, and range of values, the mode, median, and mean are the six quantities the student must determine.

PJ812 BAR GRAPH ANALYSIS
Enables the student to develop facility in statistically analyzing a bar graph of randomly generated data values.

PJ813 DECIMALS I
Enables the student to develop facility in dealing with the addition and subtraction of decimals. Each numerical value may have one, two, or three places to the right of the decimal point.

PJ814 DECIMALS II
Similar to PJ813 but dealing with the multiplication and division of decimals.

PJ815 VERBAL PROBLEMS I - NUMERICAL RELATIONSHIPS
Enables the student to develop facility in dealing with the solution to verbal problems involving simple numerical relationships.

MICROPHYS SPECIAL CASSETTES

These programs require a 16K environment and the Commodore 2040 disk drive.

PC901 **QUESLO** - permits the creation of source files used to generate individualized exams and homework assignments.

PC902 **QUEGEN** - accesses source files prepared by QUESLO and generates and grades the exams and homework assignments.

* * *

A series of Anagram programs are designed to provide an educational challenge for virtually all age groups. Each program generates large-type anagrams which are to be deciphered. Points are awarded for correct solutions and one or two clues may be displayed when difficulty is encountered. One tries to interpret as many anagrams as possible within a given time period.

Match play may be established since the computer may be directed to generate the same sequence of anagrams for two or more players. The time interval may also be adjusted in order to compensate for age or ability differences.

The anagram programs are available in five "level of difficulty" categories. The clues provided in the school and college categories are generally definitive in nature. Thus, vocabulary, reading and spelling skills are reinforced by these programs. Many of the words used are found the Microphys vocabulary and spelling series for the corresponding grade levels.

The programs may be used with a Commodore PET/CBM computer having a minimum of 8K of memory. The Bell & Howell/Apple II versions require a 24K minimum memory configuration. Each program is recorded on a C-10 cassette and is accompanied by simple descriptive instructions. The program retail for $15 each.

PC340	Anagrams I	Recreational 1
PC341	Anagrams II	Recreational 2
PC342	Anagrams III	College 1
PC343	Anagrams IV	College 2
PC344	Anagrams V	High School 1
PC345	Anagrams VI	High School 2
PC346	Anagrams VII	Junior High 1
PC347	Anagrams VIII	Junior High 2
PC348	Anagrams IX	Elementary 1
PC349	Anagrams X	Elementary 2

A recreational/educational diskette is also available for use with the Apple/Bell & Howell and Commodore disk drives. In addition to the above 10 programs, this diskette contains the six Microphys "Wheel of Fortune" word games (PC375-PC380) as well as PC350, Crypto.

****

Future Developments

Microphys is planning to release additional educational and administrative software by September, 1981. Programs in probability, statistics, junior high school science are among the programs currently being considered.

Of special interest to teachers of chemistry and physics: Microphys is participating in the development of computer oriented laboratory manuals for use in introductory courses in these sciences. Students would have their data and analysis checked by the computer which would provide the instructor with a preliminary evaluation of student lab performance. For more information, please write directly to Microphys.

Microphys Programs

Brooklyn, New York

CHEMISTRY & PHYSICS CASSETTES

1 Linear Kinematics
2 Projectile Motion*
3 Momentum and Energy*
4 Energy and the Inclined Plane
5 Inelastic Collisions
6 Centripetal Force
7 Pulley Systems · Machines*
8 Specific Heat Capacity
9 Calorimetry
10 Heats of Fusion/Vaporization
11 Specific Gas Laws
12 General Gas Law
13 Thermodynamics I
14. Thermodynamics II
15 Tranverse Standing Waves
16 Longitudinal Standing Waves
17 Lenses and Mirrors*
18 Refraction of Light
19 Series Circuit Analysis
20. Parallel Circuit Analysis I
20A Parallel Circuit Analysis II
21. Series/Parallel Circuit Analysis
22 Faraday's Law
23. Gram-Molecular Mass
24. The Mole Concept*
25. The Molarity Concept*
26. The Normality Concept
27. The Molality Concept
28. Stoichiometry: Mass/Mass
29. Stoichiometry: Mass/Volume
30. Stoichiometry: Volume/Volume
31. Stoichiometry: General*
32. Percent Concentration
33. pH Concept
34. EMF of Electrochemical Cells
35. Electric Field Analysis
36. Photoelectric Effect
37. Symbols and Valence Drill
38. Naming Compounds Drill*
39. Formulas of Compounds Drill*
40. Total Internal Reflection

VOCABULARY CASSETTES

401. 12th Grade I
402. 12th Grade II
403. 12th Grade III
404. 12th Grade IV
405. 12th Grade V

406. 11th Grade I
407. 11th Grade II
408. 11th Grade III
409. 11th Grade IV
410. 11th Grade V

411. 10th Grade I
412. 10th Grade II
413. 10th Grade III
414. 10th Grade IV
415. 10th Grade V

416. 9th Grade I
417. 9th Grade II
418. 9th Grade III
419. 9th Grade IV
420. 9th Grade V

421. 8th Grade I
422. 8th Grade II
423. 8th Grade III
424. 8th Grade IV
425. 8th Grade V

426. 7th Grade I
427. 7th Grade II
428. 7th Grade III
429. 7th Grade IV
430. 7th Grade V

SPELLING PROGRAMS

601 Spelling I Grade 12
602 Spelling II Grade 12
606 Spelling I Grade 11
607 Spelling II Grade 11
611 Spelling I Grade 10
612 Spelling II Grade 10
616 Spelling I Grade 9
617 Spelling II Grade 9
621 Spelling I Grade 8
622 Spelling II Grade 8
626 Spelling I Grade 7
627 Spelling II Grade 7

MATH CASSETTES · SENIOR HIGH SCHOOL

701 Quadratic Equations
702. Trigonometryl
703. Simultaneous Equations (2x2)
704. Simultaneous Equations (3x3)
705. Geometrical Areas
706. Trigonometry II
707. Verbal Problems I · Numbers
708. Verbal Problems II · Coins
709. Verbal Problems III · Ages
710. Verbal Problems IV · Interest
711. Verbal Problems V · Mixtures
712. Verbal Problems VI · Geometry
713. Verbal Problems VII · Rates
714. Verbal Problems VIII · Digits
715. Verbal Problems IX · Work
716. Arithmetic Progressions I
717. Arithmetic Progressions II
718. Geometric Progressions I
719. Geometric Progressions II
720. Types of Variation
721. Linear Equations
722. Formula Evaluation
723. Coordinate Geometry I
724. Exponents and Logarithms
725. Verbal Problems · General

CALCULUS CASSETTES

*726 Differentiation of Algebraic Functions
*727 Maxima/Minima Problems: Part I
*728 Maxima/Minima Problems: Part II
*729 Relative Rate Problems: Part I
*730 Relative Rate Problems: Part II
*731 Integration of Algebraic Functions
*732 Differentiation of Trig. Functions
*733 Integration of Trig. Functions
*734 Integration: Areas of Plane Figures
*735 Integration: Volumes of Solids
*736 Integration: Arc Lengths
*737 Integration: Surface Areas of Solids

* NEW RELEASES

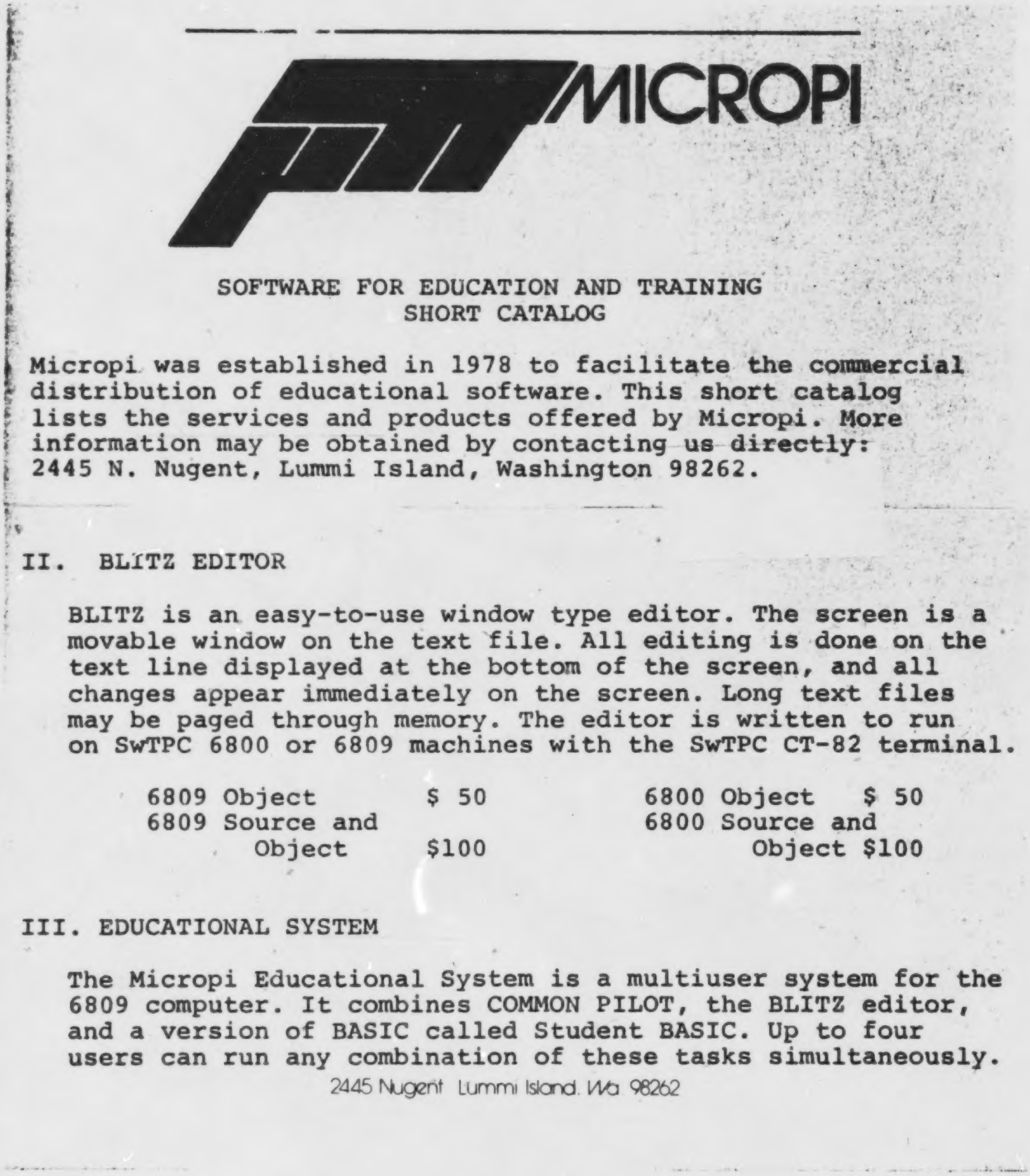
MATH CASSETTES · JUNIOR HIGH SCHOOL

801 Magic Squares
802 Multiplication
803 Division
804 Modular Arithmetic
805 Proportion Problems
806 Percent Problems
807 Addition of Fractions
808 Subtraction of Fractions
809 Multiplication of Fractions
810. Division of Fractions
811. Mode, Median, and Mean
812. Bar Graph Analysis
813. Decimals I
814. Decimals II
815. Verbal Problems I

UTILITY CASSETTES

301. Vector Analysis I
302. Vector Analysis II
303. Gas Law Analysis
304. Optics Analysis
305. Projectile Analysis
306. Calorimetry Analysis
307. Chemistry I Analysis
308. Chemistry II Analysis
309. Stoichiometry Analysis

THE COST OF EACH
CASSETTE IS $20



MICROPI

SOFTWARE FOR EDUCATION AND TRAINING
SHORT CATALOG

Micropi was established in 1978 to facilitate the commercial distribution of educational software. This short catalog lists the services and products offered by Micropi. More information may be obtained by contacting us directly: 2445 N. Nugent, Lummi Island, Washington 98262.

II. BLITZ EDITOR

BLITZ is an easy-to-use window type editor. The screen is a movable window on the text file. All editing is done on the text line displayed at the bottom of the screen, and all changes appear immediately on the screen. Long text files may be paged through memory. The editor is written to run on SwTPC 6800 or 6809 machines with the SwTPC CT-82 terminal.

6809 Object	$ 50	6800 Object	$ 50
6809 Source and Object	$100	6800 Source and Object	$100

III. EDUCATIONAL SYSTEM

The Micropi Educational System is a multiuser system for the 6809 computer. It combines COMMON PILOT, the BLITZ editor, and a version of BASIC called Student BASIC. Up to four users can run any combination of these tasks simultaneously.

2445 Nugent Lummi Island. Wa 98262

V. ICOPI

This is a CAI course in COMMON PILOT which teaches about programming in COMMON PILOT. It requies about 2 hours.

Versions available ($100)

TRS-80*, CP/M, North Star, FLEX, 9track tape,
Apple*, TERAK

VI. QUAL

This is a simulation of an inorganic laboratory experiment in the identification of ions.

Versions available ($150)

CP/M, North Star, FLEX, 9 track tape, TERAK, Apple*

VII. NOTAT

This is an introduction to scientific notation.

Versions available ($75) - Same as QUAL

COMMON PILOT is also available for the 6800 (FLEX) and Alpha Microsystems. * - available Fall 1980

The version of the BLITZ editor included in this system does not provide for paging long files or for saving backup files. The editor can be used to create COMMON PILOT and Student BASIC programs.

6809 Multiuser System (run under FLEX)	$250

COURSEWARE

Micropi sells courseware written in COMMON PILOT. We are interested in quality courseware for any level of training or education. We will also undertake custom programming of CAI material.

IV. ENGLISH GRAMMAR

This is a series of drill programs in English grammar totaling about 20 - 25 hours of instruction. We offer this in five segments or as a package. This material will be ready for release in late summer or early fall of 1980.

Price $100 per segment, $400 package

Versions available*

Apple, TRS-80, CP/M, FLEX, 9 track tape

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30420 VIA RIVERA / RANCHO PALOS VERDES / CA 90274 / (213) 541-5131

FREQOUT

This program is a package of routines that utilizes the MICROPRODUCTS ADC/DAC card to turn the Apple II into a powerful signal analysis tool. The four principal routines provide for the acquisition of data, examination of the data, Fourier conversion of the data to the frequency domain and examination of how the amplitude of any frequency component varies with time. The program allows analysis of speech, musical instruments, bio-medical signals and any other signal that falls into the audio and sub-audio spectrum. The program provides HIRES graphics and supports a variety of printers. The program is written entirely in machine language with custom graphics routines for maximum speed. It runs on all full memory Apples including Applesoft/ROM and accommodates multi-disk systems. It is available in either DOS 3.2 or 3.3 for $49.95.

The data acqusition routine provides for acquiring a single byte precision data base either through the ADC or from disk. Data base sizes up to 8192 samples are accommodated with selectable sampling rates ranging from one sample/second to 16,384 samples/second. When data is acquired through the ADC, manual and automatic methods are provided for starting the acquisition of data. Acquisition may be started manually by depressing a key or automatically by setting upper and lower waveform trigger points. The automatic mode allows capture of random events.

After obtaining a data base, it may be examined in an HIRES graphics "oscilloscope" mode in which the waveform amplitude is displayed as a function of time. The display time base is selected by specifying the number of samples (4 to 256) to be displayed in a sweep. The graphics are supplemented by text indicating time/sweep and data set number (sweep counter). Three interactive sweep modes are provided the keyboard: single point per command, single sweep per command, or sweep continuously through data base. Following examination of the data base, it may be edited and stored on disk under a file name for future use. Editing is provided through specifying which sets (range) to store.

Fourier conversion of the data base is accomplished by a variable length fast Fourier transform (FFT). Frequency resolution is selected by specifying the number of samples (4 to 256 samples) to undergo simultaneous transformation. A large time base yields fine frequency resolution and coarse envelope resolution. A time base of (k samples/set)/(n samples/sec) yields a frequency resolution of n/k Hertz and a maximum frequency component of n/2 Hertz. The data base is not destroyed by the creation of frequency domain data. The HIRES graphics are supplemented by text which provides set number, time base, amplitude and frequency of point being plotted. As above, three sweep modes are provided.

The last routine permits analysis of a specific frequency. The sets of frequency domain data are scanned for the specified frequency and a HIRES plot of that frequency's magnitude versus time is generated. The graphics are supported by the text and sweep modes described above. In addition, printers are sent a time base and frequency header followed by the magnitude values.

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MUSIC II

If mankind's first musical instrument produced only perfectly pitched, constant amplitude sine waves, the whole concept of music would have been written off as too boring. Our fascination with musical sound stems from its complexities: overtones (harmonics), envelope, vibrato, tremulo, etc. For instance, a plucked instrument produces a note which quickly increases in amplitude to a peak amplitude and then dies off relatively slowly. If we examine the frequency composition of that note, say every 25ms, we'll see that each segment consists of a number of harmonically related frequencies and, further, that the relative amplitudes of frequencies in one segment are not the same as in another segment. Complicated to describe, easy to hear; our ears do not confuse banjos with harps. Musical interest also stems from complexities in execution such as intentionally distorting the rhythm or tying groups of notes together into phrases.

The purpose of this introduction is to point out that when it comes to electronic music synthesis, simple synthesis will generate simply boring music. With this in mind, MICROPRODUCTS set out to create a sophisticated, yet easy to use electronic music synthesizer. This program is supplied at no cost with the Data Acq. & Dist. card.

MUSIC II is a set of programs for the MICROPRODUCTS ADC/DAC card which turn the Apple II into a sophisticated music synthesizer. Four programs provide for the creation of complex musical waveforms, the entering and editing of musical scores, the transformation of scores into computer musical instructions (compiler), and a program to play the music through the DACs. A library of musical instruments (ie, waveforms) may be created which can be called up for use within the musical scores. The programs permit the playing of four notes simultaneously (or more with a trick) and the use of several instruments simultaneously. The programs support a variey of printers and are written entirely in machine language for maximum speed. They run on all full memory Apples including Applesoft/ROM and accommodate multi-disk systems. They are available in either DOS 3.2 or 3.3

The waveform generator program provides for the creation of "musical instruments" by parametric definition of a prototype note. The note is broken into segments to permit the duration of each segment and the amplitude of each frequency component of each segment to be specified. Both the prototype note and its specification are stored on disk. Editing features enable easy and rapid changes to a waveform. HIRES graphics plot the waveform as it is generated. A print mode provides hard copy of the specification.

The program for entering musical scores utilizes a specialized text editor which minimizes the drudgery of entering or changing scores. The program accepts key and time signatures, tempos, multiple ending repeats, and waveform (instrument) designators. The range of notes spans the piano keyboard. While most designations follow standard musical convention, some have been modified to enhance musical expression. For example,. a measure may contain 64 beats with the quarter notes (nominally 16 beats) slightly shortened or lengthened for rhythmic purposes. The score may be printed and stored on disk.

The compiler program generates a machine language musical score from the text musical score. The compiler indicates the location of syntax errors and provides a library of error messages. A print mode obtains a hard copy of the errors. A successfully compiled score may be stored on disk.

The fourth program plays the music through the MICROPRODUCTS DACs. When given a title, the program loads the compiled score along with the appropriate prototype waveforms from disk and plays the music. A disk can contain as much music as an LP record. Included with MUSIC II are several pieces of music and prototype waveforms. You need not explore the fascinating realm of waveform definition in order to score your first music.

Turn Your Personal Computer Into a Mathematical Genius!

muMATH Symbolic Math System expands your computer's capabilities beyond the limits of numerical evaluation to a much higher level of math sophistication.

Symbolic math is a whole new realm of power for microcomputers which traditionally have been limited to the arithmetic operations—addition, subtraction, multiplication, division and exponentiation. Microsoft muMATH gives you the power to do algebra, trigonometry, calculus, integration, differentiation and more—power that has previously been reserved for a few very large computers only.

muMATH Saves You Time

With muMATH, you use your brains for the important aspects—determining how to get the information you need. You don't waste your time on the tedious mechanics of getting your final answer. Type in the expression you want muMATH to solve or simplify. muMATH will give you an answer in a mere fraction of the time you could compute it manually.

For students and teachers, it's an educational tool. muMATH helps students learn by giving them immediate feedback on their understanding of newly introduced mathematical functions. A student can check quickly to see if his method is right. There's no confusion because of a simple mechanical error. muMATH can support the standard mathematics curriculum from elementary arithmetic through algebra, trigonometry and calculus.

For scientists and engineers, it's a professional tool. In practical, professional applications, muMATH is an incredible time saver. It performs the exact numerical and symbolic computation that scientists and engineers need on the job.

Let's Get Down to Specifics

Among the new mathematical capabilities muMATH brings to your computer are:

- **Exact rational arithmetic.** When you perform an operation on a fraction, you get a fraction as the answer, so there's no round off error.
- **Virtually infinite precision.** Up to 611 digits. You realize how large 10^{611} is when you compare it to the estimated number of electrons in the entire universe, 10^{72}. Numbers may be expressed in any desired radix base from 2 through 36.
- **Unbound variables.** Variables to which no value has been assigned may be used. muMATH treats them as legitimate algebraic unknowns.
- **Exact solution of an algebraic equation.**
- **Treatment of equations as expressions** which can be assigned, added, multiplied, squared, etc.
- **Logarithmic, exponential and trigonometric simplifications and transformations**
- **Symbolic integration of indefinite and definite integrals.**

A Sample of muMATH Power

Here are just a few of the ways you can use the muMATH/muSIMP package:

Computing factorials.

```
• ? 100!;
• @ 93326215443944152681699238856266700490715968264381621468592963895217599993
  229915608941463976156518286253697920827223758251185210916864000000000000000000
  000000
```

Expanding an algebraic expression.

```
• ? (1+X) ↑ 3/(1+X+Y) ↑ 2;
• @ (1+3*X+3*X ↑ 2+X ↑ 3) / (1+2*X+2*Y+2*X*Y+X ↑ 2+Y ↑ 2)
```

Adding fractions.

```
• ? 1/3+5/6+2/5+3/7;
• @ 419/210
```

Expanding a logarithmic expression.

```
• ? LN(X*X ↑ Y/Z);
• @ Y*LN(X)+LN(X)-LN(Z)
```

Creating a muMATH function in muSIMP.

```
• FUNCTION TAYLOR(EXPN, X, A, N,
        %Local vars: % J, C, ANS, NUMNUM, DENNUM),
    NUMNUM: DENNUM: 30,
    J: ANS: 0,
    C : 1,
    LOOP
      ANS: ANS + C * EVSUB(EXPN,X,A),
      WHEN J=N, ANS EXIT,
      EXPN: DIF(EXPN,X),
      J: J+1,
      C: C * (X-A)/J,
    ENDLOOP
  ENDFUN $
• ? TAYLOR(SIN(X),X,0,10);
• @ X -X ↑ 3/6 + X ↑ 5/120 - X ↑ 7/5040 + X ↑ 9/362880
```

Computing a partial derivative.

```
• ? PXY : DIF(DIF(SIN(X) ↑ 2 * #E ↑ COS(Y), X), Y);
• @ - #E ↑ COS(Y) * SIN(Y) * SIN(2*X)
```

Integrating an expression.

```
• ? INT(X ↑ N + X*SIN(X ↑ 2), X);
• @ X ↑ (1+N)/(1+N) - COS(X ↑ 2)/2
```

Performing a trigonometric expansion.

```
• SIN(2*Y)*(4*COS(X) ↑ 3-COS(3*X) + SIN(Y)*COS(X+Y+#PI) - COS(X-Y));
• @ 4*SIN(Y)*COS(X)*COS(Y)
```

muSIMP Programming Power

You can expand the capabilities provided in the muMATH package by programming your own. muSIMP, the language in which muMATH is written, is included in the muMATH package.

muSIMP, a superset of the language LISP, is an extensible, high level programming language especially suitable for programming interactive symbolic mathematics and other artificial intelligence applications.

muSIMP is an applicative, recursive language which makes it ideal for describing complex mathematical concepts. muSIMP function definitions are easily regarded as data, encouraging incremental system development and making muSIMP an ideal interactive language.

Major muSIMP features include:

- Many LISP-like functions, including a full complement of Selectors, Constructors, Comparators, and Recognizers, are primitively defined in machine language.
- Infinite precision integer arithmetic expressed in any desired radix base from 2 through 36, is supported by a complete set of numerical primitives.
- A two-pass garbage collector performs automatic, dynamic memory management on all data spaces. Dynamic memory management allows muSIMP to respond to queries of arbitrary difficulty, a necessary ability in artificial intelligence applications.

- Flexible program control structures such as WHEN/EXIT, BLOCK/ENDBLOCK, and LOOP/ENDLOOP permit programs to be written in an elegant recursive style while still allowing the efficiency of a non-recursive loop construct.
- User functions can be defined as either Call by Value or Call by Name and as either Spread or No-spread.
- Debugging is facilitated by a TRACE package, informative diagnostics, and interruptable program execution.
- Extremely fast program execution speeds have been achieved through the use of such techniques as shallow variable finding, address typed data structures, and a closed pointer universe.
- muSIMP is an extensible language allowing the user to define new operators and control structures.

The Creators

muMATH and muSIMP were developed by David Stoutemeyer and Albert Rich of The Soft Warehouse, Honolulu, Hawaii. Having first worked separately on computer symbolic math programs and microcomputer LISP interpreters respectively, Stoutemeyer and Rich worked jointly in 1978 to develop an implementation of muMATH in muSIMP, Rich's variant of his original microcomputer LISP implementation. The object of the research, according to Stoutemeyer and Rich, was to determine the feasibility of worthwhile symbolic math on computers affordable by every school, office and hobbyist. The result was muMATH, a truly revolutionary symbolic math package for personal computers.

System Requirements

muMATH and muSIMP will run on a TRS-80 Model I computer with minimum 32K and single disk. To take full advantage of the package requires a 48K system. Look for a version of muMATH for the Apple II computer in late summer.

Where To Buy muMATH

Microsoft Consumer Products are sold by computer retailers nationwide. Ask your local dealer for a demo of muMATH. If your local store doesn't have Microsoft muMATH or any of the other fine Microsoft Consumer Products, ask them to become a dealer. For the name of your nearest dealer, call Microsoft Consumer Products. If you don't have a dealer near, you can order direct from Microsoft Consumer Products. We accept VISA and Master Charge cards.

muMATH Package, Order **CATALOG NUMBER 1208**

MICROSOFT
CONSUMER PRODUCTS
400 108th Ave. N.E., Suite 200
Bellevue, WA 98004
(206) 454-1315

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3/80 10M

Microsoft's Typing Tutor.

There's no easier way to master your keyboard.

Does the "hunt and peck" method of typing slow you down? Are you a great programmer, but a lousy typist? Do you wish you could type without looking at the keys? Want to improve your typing speed and accuracy?

Now, you can turn your personal computer into the Aristotle of Typing Tutors!

Microsoft's Typing Tutor is for everyone but the most advanced typists. Faster and more efficient than any other teaching method available, it takes you through four levels of typing proficiency, from beginner to advanced.

Typing Tutor and TRM™

The advantages of Microsoft's Typing Tutor lie in its exclusive TRM™ software. TRM,™ which stands for "Time Response Monitoring," is a unique system for monitoring the keyboard 20 times-a-second (four times faster than the fastest typists). The information received from TRM™ is analyzed by the computer to monitor your skills and progress.

TRM™ is so responsive it can detect even the slight pause that occurs when you look at the keys instead of keeping your eyes on the screen. Thus, with Typing Tutor, you learn how to type the right way, according to the touch-typing method.

Microsoft's Typing Tutor keeps track of the keys you know, the keys you are learning, and, of course, the keys you don't know. This knowledge is used to create completely individualized typing drills for increasing your speed and accuracy. These drills are based on Typing Tutor's built-in vocabulary.

Typing Tutor is specifically tailored to the keyboard of your make of computer. The special characters: @, #, $, %, ( ), *, ?, that you use when programming your computer are included in the drills that Typing Tutor prepares. Numbers are also given special emphasis to help you enter your programs faster.

Unlike textbooks, or even typing teachers, Typing Tutor optimizes your memorization process. You learn touch-typing as fast and as efficiently as your mind will let you. No time is wasted drilling on keys you already know.

When you initialize Typing Tutor, it tests you to determine your skill level. You are then given a choice of learning new keys or drilling for increased speed and accuracy.

The interactive nature of the personal computer means that immediately following each drill, Typing Tutor tabulates the results. You know your speed, accuracy percentage, number of mistakes, and even the keys you are having difficulty with.

Typing Tutor is for Everyone

For the programmer. If you would like to enter programs faster and more accurately Typing Tutor is the answer. Special attention is paid to the numbers and symbols that are most often used in programs. With Typing Tutor you can learn to program as fast as you think!

For the student. There is no easier or faster way to learn typing. Improved typing skills lead to better reports and ultimately better grades. Also, Typing Tutor makes an excellent out-of-class practice aid for the student enrolled in a typing course.

For the youngster. Learning to type at an early age can lead to better language and writing skills. Since Typing Tutor is an individualized way of learning, typing skills can be learned at an early age. Typing Tutor can make learning fun!

For the "sometimes" typists. Sitting down and using Typing Tutor for 15 minutes before starting a letter can greatly improve your speed and accuracy. Since Typing Tutor determines your weaknesses instantly, "rusty" spots get cleaned up quickly.

The Secret of Typing Tutor

If you have a computer, YOU should have Typing Tutor.

Your computer is a natural teacher and Typing Tutor takes full advantage of its capabilities. The tools that you need for Typing Tutor, the typewriter style keyboard and CRT screen, are already available on your computer. The timing and memory abilities of your computer are ideal for measuring and recording speed and accuracy levels. Typing Tutor brings it all together.

Learning to type, after all, is a matter of drill. It is development of hand-eye coordination and motor skills. The combination of repetitive motor skill development, low cost monitoring capability and unique computing power is what makes possible TRM™ and Typing Tutor.

Once you've tried Typing Tutor you'll wonder how people ever learned to type without it!!

Typing Tutor's Creators

Typing Tutor was produced by The Image Producers, Inc., Chicago, Ill. Dick Ainsworth designed and developed Typing Tutor. Al Baker implemented Typing Tutor onto the TRS-80 and Apple II. The Image Producers bring unique creative talents in human communications, education and programming to the personal computer market.

According to Dick Ainsworth, Typing Tutor actually works by programming your mind and your fingers to type. It is in effect a computer program that programs people. Time Response Monitoring (TRM™) was conceived of and developed by Dick Ainsworth. Typing Tutor is a unique and excellent application of TRM.™

System Requirements

Typing Tutor for the Apple requires 16k of memory and Apple BASIC.
Typing Tutor for the TRS-80 requires 16k of memory and Level II BASIC.

Each package includes:

Cassette tape, manual and suggested lesson plans.

Where to Buy Typing Tutor

Microsoft Consumer Products are sold by computer retailers nationwide. Ask your local dealer for a demo of Typing Tutor. If they don't have Microsoft Typing Tutor or any of the other fine Microsoft Consumer Products, ask them to become a dealer. For the name of the dealer nearest you, call Microsoft Consumer Products. If you don't have a local dealer, you can order direct from Microsoft Consumer Products. We accept VISA and Master Charge cards.

For the TRS-80, order **CATALOG NUMBER 1102**
For the Apple II, order **CATALOG NUMBER 2102**

TRM is a registered trademark of The Image Producers, Inc.

MICROSOFT
CONSUMER PRODUCTS
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9/79 30M

LANGUAGE ARTS

The introductory Milliken Language Arts package contains structured drill and practice for students in Letter Recognition and Alphabetization skills. The curriculum is appropriate for students in grades 1-8. A Manager Program is included that allows teachers to make assignments and review student progress. In addition, the Manager will keep a record of incorrect answers during the Letter Recognition drill. The Sequences are designed to provide individualization of both skill and performance objectives. Student interaction with the program requires little or no supervision; therefore, it may be implemented in a variety of learning environments.

CURRICULUM

The following Sequences are included in the package:

	GRADE LEVEL							
	1	2	3	4	5	6	7	8
Letter Recognition and Alphabetization by first & second letter (1-63)	■	■	■	■				
Alphabetization by third letter and beyond (64-100)					■	■	■	■

The numbers in parentheses represent the number of problem levels in each Sequence. Problem levels are small, sequential steps which increase in difficulty. Problem levels are precisely defined so students may be easily placed at a level which challenges their abilities. As they demonstrate mastery or failure, the computer moves them up or down a problem level.

STUDENT INTERACTION

The Sequences provide students with a highly motivating, success-oriented approach to mastering Letter Recognition & Alphabetization skills. Work is completely individualized and self-paced. There is no need for paper or pencil. Feedback is immediate, as are positive reinforcements, which may be varied for primary or middle grades. If a problem is missed, the student is provided with the correct answer immediately. Scoring and record-keeping are automatically maintained.

MANAGEMENT

The package contains a Manager Program which enables teachers to maintain individual records for up to 100 students on each diskette. Features of the Manager include:

- **the ability to make personalized assignments for individuals, or general assignments for classes.**
- **the ability to establish individualized "mastery" and "failure" levels for students. Teachers can also influence the amount of work each student completes at assigned problem levels.**
- **automatic updating of student performance records with hard-copy print-outs, if desired.**
- **progress graphs which make problem areas for individual students easily identifiable.**
- **a security system which keeps all student data confidential.**

DOCUMENTATION

Milliken's comprehensive Teacher's Guide is an important part of the total courseware package. The Guide includes:

- basic procedures to help teachers use the courseware effectively.
- Scope and Sequence charts.
- examples of typical questions generated at each problem level.
- step-by-step instructions for using the Manager Program.
- an Easy-Does-It Card which provides students with illustrated instructions for operating the courseware.
- duplicating masters for optional record-keeping.

ADDITIONAL LANGUAGE ARTS PACKAGES

Several Language Arts programs are scheduled for release in the near future. Packages covering Grammar and Usage, and Reading will be introduced during the 1980-81 school year. The balance of the Study Skills package, which will include Letter Recognition and Alphabetization, will be available at the beginning of the 1981-82 school year. Please contact your local representative, or Milliken Publishing Company, for additional information.

ORDERING INFORMATION

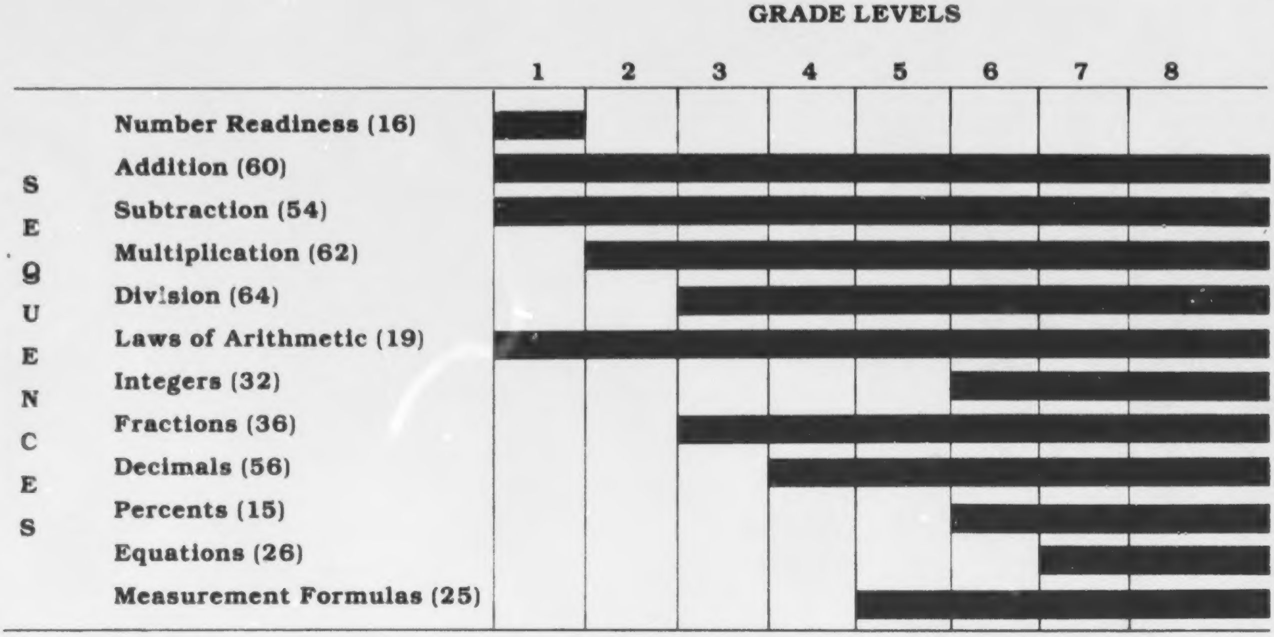
QTY	STOCK NO.	DESCRIPTION	PRICE	TOTAL
	L101	Language Arts Sequences, 2 Diskettes for **Apple II Plus (48K)***	$75.00	
	Replacement Diskettes	Please specify computer and diskette names	$40.00	

MATHEMATICS

The REVISED Milliken Math Sequences package replaces the previous package, effective October 1, 1980. The new 12 diskette package offers a comprehensive, objective-based curriculum with structured drill and practice for students in grades 1-8. A Manager Program is included that allows teachers to make assignments and review student progress. The Sequences are designed to provide individualization of both skill and performance objectives. Student interaction with the program requires little or no supervision; therefore, it may be implemented in a variety of learning environments.

CURRICULUM

The scope of the Milliken curriculum is substantial. The following Sequences are included in the package:



The numbers in parentheses represent the number of problem levels in each Sequence. Problem levels are small, sequential steps which increase in difficulty. Problem levels are precisely defined so students may be easily placed at a level which challenges their abilities. As students demonstrate mastery or failure, the computer moves them up or down a problem level.

STUDENT INTERACTION

The Sequences provide students with a highly motivating, success-oriented approach to mastering mathematics skills. Work is completely individualized and self-paced. All computations can be performed on the screen, eliminating the need for paper and pencil. Feedback is immediate, as are positive reinforcements, which may be varied for primary or middle school grades. If a problem is missed, the student is provided with a step-by-step solution. Scoring and record-keeping are maintained automatically.

MANAGEMENT

The package contains a Manager Program which enables teachers to maintain individual records for up to 100 students on each diskette. Features of the Manager include:

- the ability to make personalized assignments for individuals, or general assignments for classes.
- the ability to establish individualized "mastery" and "failure" levels for students. Teachers can also influence the amount of work each student completes at assigned problem levels.
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- progress graphs which make problem areas for individual students easily identifiable.
- a security system which keeps all student data confidential.

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- basic procedures to help teachers use the courseware effectively.
- Scope and Sequence charts.
- examples of typical problems generated at each problem level.
- step-by-step instructions for using the Manager Program.
- an Easy-Does-It Card which provides students with illustrated instructions for operating the courseware.
- duplicating masters for optional record-keeping.

ADDITIONAL PACKAGES

The revised Math Sequences package, is only available for the Apple II Plus (48K) with disk drive. The program is contained on 12 diskettes.

Another version of the program, on 12 cassettes, is available for the Commodore Pet (8K) and TRS-80 (16K, Level II). Please note: these programs contain an abbreviated 1-6 curriculum and no management capabilities.

ORDERING INFORMATION

QTY	STOCK NO.	DESCRIPTION	PRICE	TOTAL
	M1001 (Revised)	Math Sequences, 12 Diskettes for Apple II Plus (48K)*	$450.00	
	M1001A (Revised)	Includes M1001, plus extra set of 12 diskettes for back-up	$675.00	
	M1003	Math Sequences, 12 Cassettes for TRS-80 (Level II, 16K)**	$200.00	
	M1004	Math Sequences, 12 Cassettes for Commodore Pet (8K)***	$200.00	
	Replacement Diskette	Please specify computer and diskette names	$ 40.00 @	
	Replacement Cassette	Please specify computer and cassette names	$ 20.00 @	

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1100 Research Boulevard
St. Louis, MO
63132

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Ext. 802

Village Data Center
P.O. Box 603
Joshua Tree, California 92252

Assistant Principal

Monument Computer Service has announced the release of a new software applications package for the Apple Computer. The "Assistant Principal" is a complete administrative package for high school and junior high schools. The package provides total control of class rosters, student master records, student schedules, teacher assignments, and grade reporting.

The system allows the school administrator to design student input documents, enter students onto the system, schedule their classes, print class rosters, accept grades and test scores, print report cards, print file folder labels and prepare student master records. The system automatically prints ranked class lists and records attendance information.

The system requires two disk drives and Applesoft in ROM. The system is provided on seven diskettes with a two volume operating manual for $500.00. The operating manuals are available separately at $50.00. Item # m-3839-11.

jem research
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The Professor

The Professor is a universal teaching program designed to teach almost any subject. The teacher can "teach"-The Professor his subject in pre-programmed lessons and then the student can work at his or her own pace to master the subject. It can be used to review second grade spelling words or advanced Physics for your college sophomore. This is a great mid-term aid used by many schools and colleges. Applesoft II.Disc, $29.95; Tape, $19.95. Item # JE-2.

School Days

This is a complete educational system. Let your Apple teach Spelling and Math in an interesting and fun set of education programs. This is a complete educational aid for for grades 1 through 8 or those of who just missed the New Math. The package includes The Math Teacher, State Capitals, Scramble words, Crosswords, and a featured element on number base systems. Applesoft II and Integer Basic. Disc-$49.95. Item # JE-1.

ITEM NO.	QTY.	DESCRIPTION	PRICE EACH	TOTAL PRICE

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COMPUTER COURSEWARE

✓**Magic Grid.** Algebra readiness program in which student is shown a 9 cell grid with 9 basic algebra problems, randomly generated by computer. Includes tutorial suggestions for those who need help. Grade 6-9. 32 K memory. Language: Applesoft, TRS-80 Level II Basic.

81A08782-2 43001 Apple II Diskette
Each 37.50
81A08783-1 43003 TRS-80 Cassette
Each 37.50

Graph Builder. 44264. Basic instructional sequences and motivating games teach students to read and plot graphs. Grades 6-9. 16 K memory.

81A08784-0 TRS-80 Cassette
Each 31.10

Number Series. 8 lessons to reinforce math and logic skills and provide practice in problems seen on most standardized tests. Grades 7-12. 16 K Memory. Languages: Apple Integer, TRS-80 Level II Basic.

81A08785-9 44271 Apple II Diskette
Each 40.75
81A08786-8 44272 Apple II Cassette
Each 31.10
81A08787-7 44274 TRS-80 Cassette
Each 31.10

✓**COMPU-MATH.** 2 interactive programs presenting step-by-step instruction for grades 6-10. Each includes pre-test to place student. 48 K memory. Language: Applesoft.

✓**Fractions.** 44391. Definitions, common and lowest denominator, basic operations using fractions and mixed numbers.

81A08788-8 Apple II Diskette Each 63.30

*Apple II is a trademark of Apple Computer, Inc.
**TRS-80 is a trademark of Tandy Corporation.

✓**Decimals.** 44431. Conversions, rounding off, percentage, basic functions.

81A08789-5 Apple II Diskette Each 63.30

✓**Spelling Builder.** 7 lessons on spelling rules, plus a 320 word spelling test on audio cassette, which comes with the program. 16 K memory. Language: Applesoft, TRS-80 Level II Basic.

80A03071-7 44311 Apple II Diskette
Each 47.30
80A03072-6 44312 Apple II Cassette
Each 39.15
80A03073-5 44314 TRS-80 Cassette
Each 39.15

✓**Vocabulary Builder.** 10 lessons on synonyms and antonyms, plus vocabulary test. Program presents 2000 progressively more difficult words. Grades 7-12. 8 K memory. Languages: Apple Integer, TRS-80 Level II Basic.

80A03074-4 44281 Apple II Diskette
Each 40.70
80A03075-3 44282 Apple II Cassette
Each 31.10
80A03076-2 44284 TRS-80 Cassette
Each 31.10

✓**What's Different?** 10 lessons in which student selects word which does not belong in given list. Reading level ranges from 1-6. Grades 3-8. 16 K memory. Language: Applesoft, TRS-80 Level II Basic.

80A03077-1 44411 Apple II Diskette
Each 40.70
80A03078-0 44412 Apple II Cassette
Each 31.10
80A03079-9 44414 TRS-80 Cassette
Each 31.10

Story Builder/Word Master. Story Builder has 3 lessons to teach verbs, nouns, and adjectives. Word Master is classic "Hangman" game, with 3 letter words generated by computer. Grades 4-8. 8 K memory. Languages: Apple Integer, TRS-80 Level II Basic.

80A03080-5 44421 Apple II Diskette
Each 40.70
80A03081-4 44422 Apple II Cassette
Each 31.10
80A03082-3 44424 TRS-80 Cassette
Each 31.10

✓**Compu-Read.** 44381. Electronic tachistoscope to help increase comprehension and retention. User selects time letters or words appear on screen and number of trials per lesson. 2 lessons allow teachers to add their own word lists. Computer reports on progress. Grades 6-12. 32 K memory. Language: Applesoft.

80A03083-2 Apple II Diskette Each 47.30

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COMPUTER COURSEWARE FROM MILLIKEN PUBLISHING

COMPUTERS IN THE CLASSROOM

Microcomputers are appearing in schools across the country. Milliken Publishing is turning these computer systems into learning systems with comprehensive, curricular courseware. Just look at some of the advantages Milliken's Courseware offers:

Structured Curriculum for implementation in a variety of learning environments.

Individualized, Self-Paced instruction for students at all ability levels.

Immediate Feedback and Reinforcement including "help" with incorrect answers.

Motivational Impact because students really enjoy using the courseware . . . it's fun!

Management and Record Keeping of students' performance data for the busy teacher.

MANAGEMENT

Accountability is a necessity in the classroom and Milliken Courseware offers teachers just that. The Manager Program enables teachers to maintain individual records for up to 100 students on each diskette. Features of the Manager include:

- The ability to make personalized assignments for individuals or general assignments for classes.
- The ability to establish individualized "mastery" and "failure" levels for students. Teachers can also influence the amount of work each student completes at assigned problem levels.
- Automatic updating of student performance records with hard-copy print-outs, if desired.
- Progress graphs which make problem areas for individual students easily identifiable.
- A security system which keeps all student data confidential.

MATH SEQUENCES

The revised Math Sequences package offers structured drill and practice for students in Grades 1-8. All computations are made on the computer. The following Sequences are included in the package:

Numbers Readiness*	Grades 1-8
Addition	Grades 1-8
Subtraction	Grades 1-8
Multiplication	Grades 2-8
Division	Grades 3-8
Laws of Arithmetic	Grades 1-8
Integers	Grades 6-8
Fractions	Grades 3-8
Decimals	Grades 4-8
Percents	Grades 6-8
Equations*	Grades 7-8
Measurement Formulas*	Grades 5-8

*Indicates new Sequences in the revised diskette package and are not included in the non-revised cassette packages.

LANGUAGE ARTS SEQUENCES

The introductory Language Arts Package offers structured drill and practice for students in Letter Recognition and Alphabetization. The Sequences provide students with a highly motivating, success-oriented approach to mastering basic skills.

New packages in Grammar, English Usage and Reading will be introduced during the school year. Please contact your Moyer rep. for additional information.

A TOTAL PACKAGE

Milliken makes it easy for teachers and students to use the Courseware with a comprehensive Teacher's Guide. The Guide includes Scope and Sequence charts, step-by-step instructions for using the Courseware and Manager, and other supplementary material which insure that teachers and students will receive the maximum benefit from the package.

M1001. (Revised) Math Sequences, 12 diskettes for Apple II Plus (48K)*. Grades 1-8.
81A08870-5 Per set .... * 526.50

M1001A. (Revised) Includes M1001, plus extra set of 12 diskettes for back up.
81A08898-1 Per set .... * 789.75

M1003. Math Sequences, 12 cassettes for TRS-80 (Level II, 16K)**. Grades 1-6.
81A08872-3 Per set .... * 234.00

M1004. Math Sequences, 12 cassettes for Commodore Pet (8K)***. Grades 1-6.
81A08873-2 Per set .... * 234.00

L101. Language Arts Sequences, 2 diskettes for Apple II Plus (48K)*.
80A09167-6 Per set .... * 97.75

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All major computer systems are checked for functional hardware analysis on a regular basis for logical as well as some practical reasons. Finding what is exactly wrong can account for most of the money consuming down-time.

Apple Computer Co. has provided you with the best equipment available to date. The Diagnostic's Package was designed to check every major area of your computer, detect errors, and report any malfunctions. ***The Brain Surgeon*** will put your system through exhaustive, thorough procedures, testing and reporting all findings.

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- DISK DRIVE ANALYSIS
- MONITOR ALIGNMENT
- DC HAYES MICRODODEM II TEST

System Diagnosis is an invaluable aid to your program library even if your system is working fine. Hours have been wasted trying to track down a "program bug" when actually hardware could be the blame!

The Brain Surgeon allows you to be confident of your system. This can be critical when file handling, sorts or backups are involved. You *must* depend on your computer during all these critical times. Running ***The Brain Surgeon*** prior to these important functions helps to insure that your system is operating at peak performance.

The Brain Surgeon is easy to use
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complete documentation.

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DOS 3.2 or 3.3

Nikrom Technical Products
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Trademark of D.C. HAYES

ON-GOING IDEAS

* * * * *

NAME: STATISTICS PACKAGE 1.0
SYSTEM: TRS-80 MODEL I or APPLE II
MEMORY: 16K
LANGUAGE: LEVEL II BASIC or APPLESOFT
HARDWARE: Line Printer (for Scattergram)

DESCRIPTION: This package includes some very useful- and powerful statistical routines: 1) Wilcoxon Rank Sum (Mann-Whitney) Test; 2) Student T-Test with Welch modification for unequal variances; 3) Two-Way Contingency Table; 4) Wilcoxon Signed Rank Test; 5) Scattergram

AUTHOR: Jack Bectel PRICE: $24.95 on cassette.

* * * * *

ON-GOING IDEAS
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PDI

TURN YOUR APPLE* INTO A TEACHING MACHINE

All titles available on cassette or on disk ($5.00 additional.)

COMPUTER PROGRAMMING

STEP BY STEP Ages junior high to adult **$49.95** ($59.95)
32 programs and a 64-page workbook teach programming in BASIC for the beginner. Introduces all important BASIC commands and programming logic, including simple string logic and one-dimensional arrays. Lessons are interactive, presented in a question-and-answer format on the computer screen. The Workbook adds extra information. Through instruction, structured practice, and frequent skills testing, the user learns how to write BASIC programs.
3 tapes, Workbook, vinyl binder

EDUCATIONAL GAMES

MEMORY BUILDER: CONCENTRATION Ages 6 up **$14.95** ($19.95)
A series of educational games to improve memory, attention span and concentration. Letters and 3-letter words are used. Player has three options: play against the computer, play against him or herself, play against another player. Especially good for parent and child to play together.

STORY BUILDER/WORD MASTER Ages 9 up **$14.95** ($19.95)
Series of partially completed verses that the child completes. Teaches grammar skills in an enjoyable way. Word Master is a logic game where the child tries to guess a 3-letter word generated by the computer. Teaches reasoning and vocabulary.

MINICROSSWORD All Ages **$14.95** ($19.95)
4 programs that consist of 2 minicrosswords and 2 codeword games. Crossword programs invent their own crossword puzzles—hundreds of completely different puzzles are possible – and score how well you do each puzzle. When used in conjunction with the codeword programs, which are word-guessing games, the course provides a vocabulary and spelling development system.

CODE BREAKER Ages 10 to adult **$14.95** ($19.95)
3 scrambled message games of increasing difficulty that build basic word handling skills needed for good writing. First game scrambles letters within the words in the message; next 2 games scramble letters and also word order. The last game gives the hardest messages. Messages are made up by the computer from an extensive word list.

ASTRO WORD SEARCH: GEOGRAPHY Junior high to adult **$14.95** ($19.95)
Search for hidden geographical place names in a pattern of letters generated by the computer. Words can be hidden across, down, or diagonally as in the popular word-search puzzles. Hundreds of different puzzles can be formed by the puzzle in 3 programs. Computer scores you on how well you do.

ASTRO WORD SEARCH: SPANISH High school to adult **$16.95** ($23.95) Applesoft
As in Astro Word Search: Geography, the computer generates hundreds of different puzzles, but this time the hidden words are common Spanish words. Helps improve Spanish vocabulary. Computer scores you. 3 programs.

ASTRO WORD SEARCH: FRENCH High school to adult **$16.95** ($23.95) Applesoft
Like Astro Search: Spanish, except this time it's French vocabulary words.

ASTRO QUOTES High school to adult **$16.95** ($23.95) Applesoft
Fascinating game in which you guess vocabulary words from clues and the computer takes each letter from the words and puts it where it belongs in a famous quotation. As soon as you can, you guess the quotation. If it takes you too many tries to guess the quote, you lose the game. 3 versions: easy, medium, hard.

STUDY SKILLS

IQ BUILDER SERIES Junior high up
A group of 4 courses that prepare a high school student for the College Boards or adult for aptitude tests.

VOCABULARY BUILDER 1: BEGINNING 11 programs include a set of graded vocabulary questions on synonyms and antonyms (the most common type of vocabulary question on an IQ test). The last lesson is a test on vocabulary. Total of 400 questions, 2000 words in course. **$16.95** ($23.95) Integer

VOCABULARY BUILDER 2: ADVANCED 11 programs like those in Vocabulary 1, but using a more advanced word list. **$16.95** ($23.95) Integer

NUMBER SERIES Contains 8 programs that provide practice in a common math problem type. The first lesson teaches how to approach number series and how to analyze their patterns. Later lessons provide practice with increasingly difficult problems, giving clues if you have difficulty with the problem. Final lesson is a test of abilities. **$16.95** ($23.95) Integer

ANALOGIES Contains 6 programs that teach what an analogy is and what the common types are, provide a method for analyzing analogies and provide practice in handling all types of analogies. Final lesson is an analogies test. **$16.95** ($23.95) Integer

LANGUAGE ARTS

PRESCHOOL IQ BUILDER Ages 3–6 **$16.95** ($23.95) Integer
Teaches vital cognitive skills that children must learn in order to do well in school. In Part 1, Same and Different, the child discriminates between two forms. In Part 2, Letter Builder, the child matches a letter on the TV monitor to one on the keyboard. Accompanying Parent's Guide gives instruction.

READING COMPREHENSION: WHAT'S DIFFERENT? Ages 8 up **$16.95** ($23.95) Applesoft
5 reading comprehension programs which present logical problems where the student picks the one word in four which doesn't belong with the rest. Builds analytical skills essential for understanding what you read.

SPELLING BUILDER Junior high up **$19.95** ($26.50) Applesoft
8 programs plus an audio cassette teach important spelling rules and skills. Helps students and adults overcome spelling difficulties. Not just spelling drill, this course teaches a method for approaching difficult words. Ideal for the student or adult who has mastered basic spelling but has trouble deciding if it's "supersede" or "supercede", "combustable" or "combustible". Final test of 25, ten-word lists.

*Apple is a trademark of Apple Computer Corp.

Program Design, Inc. 11 Idar Court Greenwich, Conn. 06830 203-661-8799

ORDER FORM

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SATISFACTION GUARANTEED: We guarantee that the programs will run as illustrated in the instructor's guide, otherwise you pay nothing. If a set of programs fails to load properly onto your system simply notify us and a duplicate will be sent at no charge. The original tape or diskette need not be returned.

What are the Programs Like?

The programs are all interactive and fall into two general categories, drill-and-practice exercises, and simulations. The drill-and-practice programs are designed to reinforce understanding of a topic or mastery of a skill which has been previously discussed in class by presenting a series of questions and immediately evaluating the student's response. Remedial assistance is built into most of these programs to be provided as needed and the questions are parameterized whenever possible so that no matter how many times an exercise is repeated, a different series of questions will result. The exercises are self-grading, as well, a feature which is helpful in building confidence or indicating the need for additional work.

The simulation programs demonstrate principles or processes by letting students see "what-will-happen-if" certain steps are taken or particular conditions established. There are many ways to use programs of this type for they enable students to collect many sets of data over a wide range of conditions in a relatively short period of time. Hence students can seek correlations and draw conclusions concerning a particular phenomenon or process based on individually generated sets of values. Such programs are also highly useful as preparatory assignments for laboratory experiments which involve the same principles.

ACID-BASE CHEMISTRY

Contributors: J. Beck, G. Breneman, P. Cauchon, H. Weinstock

ABEQ - demonstrates acid-base equilibria; students vary initial concentrations and dissociation constants to observe effects on equilibrium concentrations, pH and percent dissociation.

BUFFER - demonstrates pH changes in buffer solutions; students establish initial conditions and observe pH values as a strong acid or base is added to both the buffer and a comparison sample of pure water.

BRNSTD - drill on recognition of Bronsted acids and bases in a randomly selected sequence of reactions.

DRILL1 - drill on a variety of fundamental concepts in multiple-choice format, such as identifying conjugate acids/bases and interpreting relative strengths of acids from a table of equilibrium constants.

DRILL2 - practice problems concerning pH, pOH for solutions of acids, bases and buffers of varying strengths.

ENDPT - titration simulation in which student tries to analyze an unknown acid sample in the most efficient manner.

KHP - practice with problems concerning standardization with potassium acid phthalate and determination of equivalent weight of unknown acid.

MOLAR - practice problems concerning moles, grams and molarity of solutions.

PH - pH problem exercise presented in stages arranged in order of increasing complexity.

TCPLOT - plots a titration curve demonstrating pH changes as strong base or acid is added to any weak acid or base with up to eight dissociation constants.

TCPROB - practice problems of the type encountered in plotting a titration curve.

Package No. AB-1 Eleven programs with instructor's guide $100

ATOMIC STRUCTURE

Contributors: J. Beck, G. Breneman, G. Brubaker, P. Cauchon,
H. Weinstock

ATOMIC	drill on the number of protons, neutrons and electrons in atoms with atomic numbers through 22.
IP	drill on predicting relative ionization energies for different atoms and ions, based on their positions in the Periodic Table.
LEWIS	drill to develop mastery of the octet rule.
MILKAN	simulation of the oil drop experiment; by varying voltage across plates, student finds conditions which keep drops stationary.
NUCLER	practice interpreting equations for nuclear reactions in which one of the sub-atomic particles has been omitted.
SPDF	drill on determining the number of electrons with given principal and azimuthal quantum numbers in a particular atom selected at random from a range determined by student.
RYDBRG	questions concerning the relationship between the energy levels and spectral lines in a hydrogen atom.
TRENDS	questions concerning various trends and relationships between atoms based on their relative positions in the Periodic Table.
VSEPR	practice using the V S E P R method to predict hybridization and geometry of simple molecules and ions.

Package No. AS-1 *Nine programs with instructor's guide* *$100*

FUNDAMENTAL SKILLS FOR GENERAL CHEMISTRY

Contributors: J. Beck, P. Cauchon, E. Mottell, M. Wartell

BALEQ - drill on balancing equations.
CONVERT - drill on Metric/English conversions.
DENSITY - practice with problems concerning density, mass and volume.
ELEMENT - drill on symbols, atomic number, electron configuration of first 20 elements.
EXPO - tutorial exercise explaining exponential notation.
IONS - drill concerning symbols and charges for common ions.
METRIC - drill on SI units of mass, length and volume.
MOLWT - practice in computing formula weights.
NOMEN - drill on names and formulas for common compounds.
SIGHELP - drill on significant figures.
SYMBOL - drill on names and symbols of elements.
TEMP - practice with temperature conversions.

Package FS-1 Twelve programs with instructor's guide $100

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If you have an Apple, PET or TRS-80 computer you may order individual programs separately from the packages. Any combination of programs may be selected at the following rate: $20 per program for 1-5, $15 each for 6 or more. Documentation is included.

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CHEMISTRY WITH A COMPUTER

—a selection of programs from the collection by Paul Cauchon, published by EDUCOMP, INC.

EQPROB - practice problems concerning equilibrium constants; given reaction type and concentrations, determine constant, or, given constant, determine concentrations.

GASES - conventional assortment of pressure - volume - temperature problems for practice with Boyle's, Charles' and the combined gas laws.

KSP - problems concerning solubility product calculations.

MOLES - drill on problems concerning percent composition and gram-mole relationships in common compounds.

EXP19 - simulation of ChemStudy experiment concerning the development of a scheme of analysis based on three solutions and four test reagents.

EXP20 - simulation of ChemStudy experiment concerning an introduction to qualitative analysis with metals of the second group.

REDOX - practice on various topics concerning oxidation-reduction systems such as identifying electrodes losing or gaining electrons, direction of electron flow, and potential difference in a given cell.

SOLUBLE - practice problems requiring interpretations of typical solubility curves.

SOLUTIONS - drill on moles, molarity, molecules and dilution.

STATE - simulation of system in which a substance is to be identified by observing changes of state when it is heated or cooled.

SYSTEM - drill on metric units of length, mass and volume.

Package No. CC-1 *Eleven programs plus a copy of CHEMISTRY WITH A COMPUTER* *$100*

CHEMICAL EQUILIBRIUM

Contributors: J. Beck, G. Breneman, G. Brubaker, P. Cauchon, W. Schweikert, H. Weinstock

ACIDEQ - practice problems on pH, pOH with strong and weak acid/base/buffer solutions (same as DRILL2 in AB-1).*

EQCALC - practice estimating equilibrium concentrations for any reaction with known equilibrium constant.

EQUIL - investigation of two systems, one with a large Keq, the other with a small constant (PCL$_5$, phosgene) to develop understanding of relation between constant and concentrations.

EQPROB - drill and practice computing concentrations from initial data and equilibrium constant, or constant from concentrations (same as EQPROB in CC-1).**

HABER - simulation of ammonia synthesis allowing variations in temperature, pressure and catalyst to show effects on speed of reaction and equilibrium concentrations.

HIEQ - simulation of hydrogen-iodine-HI equilibrium system to introduce concept of equilibrium constant.

H2S - practice problems with concentrations of various species present in hydrogen sulfide solutions at varying pH values.

KSP - practice problems with solubility product calculations (same as KSP in CC-1).**

KSP2 - practice problems using solubility product to predict precipitation when mixing dilute solutions containing ions of slightly soluble compounds.

LECHAT - drill on applications of Le Chatelier's principle.

Package EQ-1 *Ten programs with instructor's guide* *$100*

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**20% discount if you have purchased CC-1.

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The game can be played at six different levels; from STUDENT, where the computer uses everyday words and gives 3 letters of the word as a hint, to LEXICOGRAPHER, where a more sophisticated vocabulary is used and no hints are given. You will be promoted from time to time as your performance merits. The current guessing player, game level and all guesses (and their letters in common) are always displayed.

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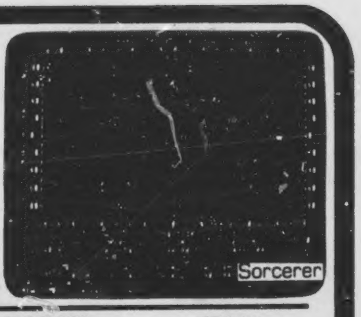

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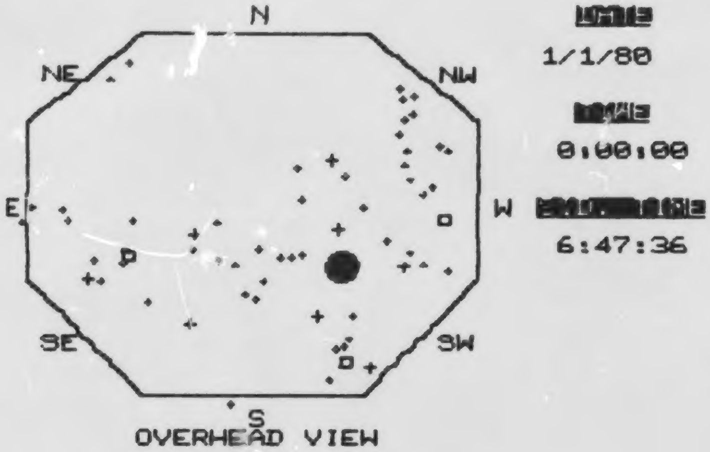


The graphics on the left side of this page are TellStar™ CRT displays. The overhead view is presented before and after constellation lines are drawn as requested by the user.

Date, time, and sidereal time (star time) are presented as well as the points of the compass.

The stars are presented according to their brightness, the brighter stars with a larger shape. There was a full moon on this viewing night, as shown by the 'full moon' shape.

'Messier objects', celestial objects of extreme interest and beauty are the small squares.

The high resolution graphics can be printed on a Silentype printer.

The following are visible in this view:

Moon (full)

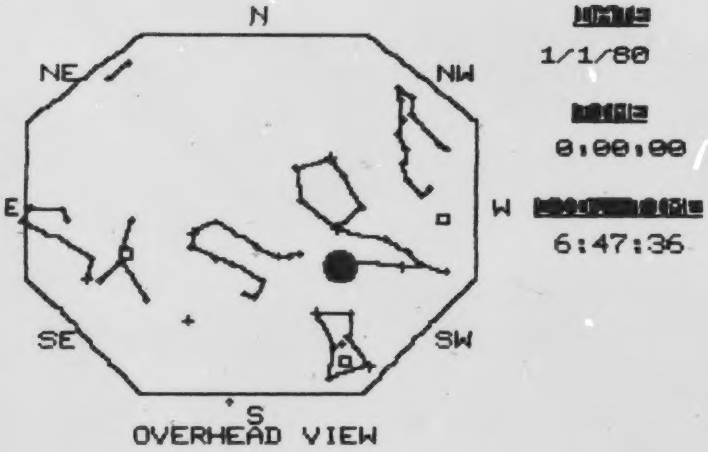
57 Stars

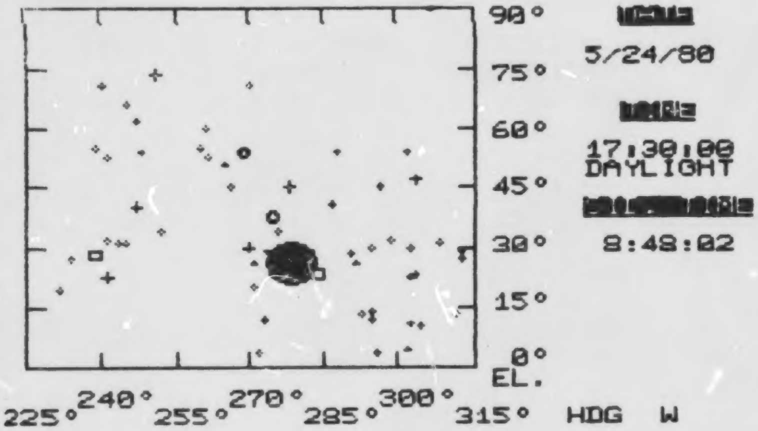
Constellations:

- Orion
- Gemini
- Taurus
- Perseus
- Cancer
- Auriga
- Leo

Messier objects:

- Orion nebulae
- Cancer galactic cluster (The Beehive)
- Taurus galactic cluster (The Pleiades)

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15°
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225°
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255°
270°
285°
300°
315°
HDG W
5/24/80
17:30:00
DAYLIGHT
8:48:02

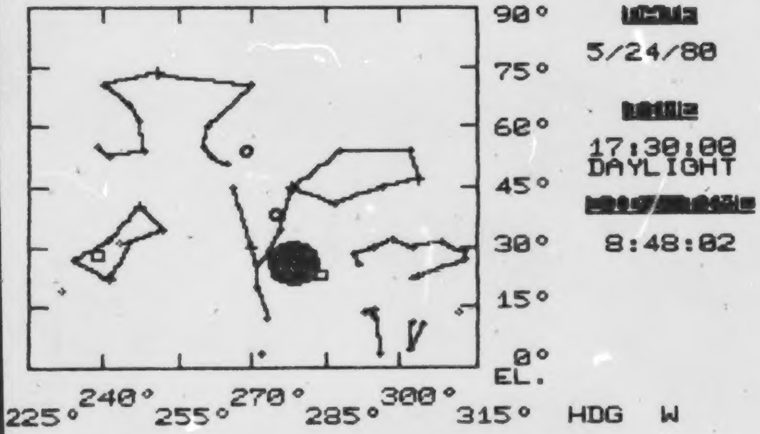
The graphics on the left side of this page are TellStar™ CRT displays. The view is presented before and after constellation lines are drawn as requested by the user.

Date, time, and sidereal time (star time) are presented as well as the points of the compass.

The stars are presented according to their brightness, the brighter stars with a larger shape. The large, bright object directly to the West is the sun.

The enclosed crosses are planets, while the small squares are Messier objects, celestial objects of extreme interest and beauty.

The high resolution graphics can be printed on a Silentype printer.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270°
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HDG W
5/24/80
17:30:00
DAYLIGHT
8:48:02

The following are visible in this view:

Sun
Mercury
Venus

52 Stars

Constellations:

- Orion
- Gemini
- Taurus
- Perseus
- Auriga
- Aries
- Triangulum

Messier objects:

- Orion nebulae
- Taurus galactic cluster
  (The Pleiades)

```
                 LOCATION
                LOS ANGELES
LAT  34D 03M 15S LONG.   W 118D 14M 28S

             OBSERVATION TIME

DATE 5/24/80      LOC. TIME  17H 30M 00S

DAY OF YEAR 145   MEAN TIME  17H 37M 02S

DAYLIGHT TIME     SID. TIME   8H 48M 02S

               UNIVERAL TIME

DATE 5/25/80      GMT         0H 30M 00S

DAY OF YEAR 146   SID. TIME  16H 41M 00S
---------------------------------------

OBJECT NAME: VENUS     PHASE: .13
MAGNITUDE:   VARIABLE

RIGHT ASCEN.           HEADING
  6H 11M 11S           268D 11M 00S

DECLINATION            ELEVATION
 26D 32M 25S            55D 32M 09S

OBJECT RISES           HEADING
  7H 47M 16S            57D 21M 47S

OBJECT SETS            HEADING
 22H 22M 42S           302D 38M 13S
```

The text information on the left is presented while TellStar™ performs its various functions. The information can be printed on your printer as requested.

The first set of data is the standard location, date, and time you have specified for your viewing. This can be anywhere on the Earth.

The second set of data is a sample of the dynamic information available for any of the hundreds of objects in the star tables. Remember, this is customtomized for 'your' specifications.

The sample shows the heading and elevation for Venus. Also, you can find the time Venus rises and the direction. The time the planet sets and the direction are also displayed.

The phase or illuminated portion of all the Planets and the Moon is shown.

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  - Standard deviations
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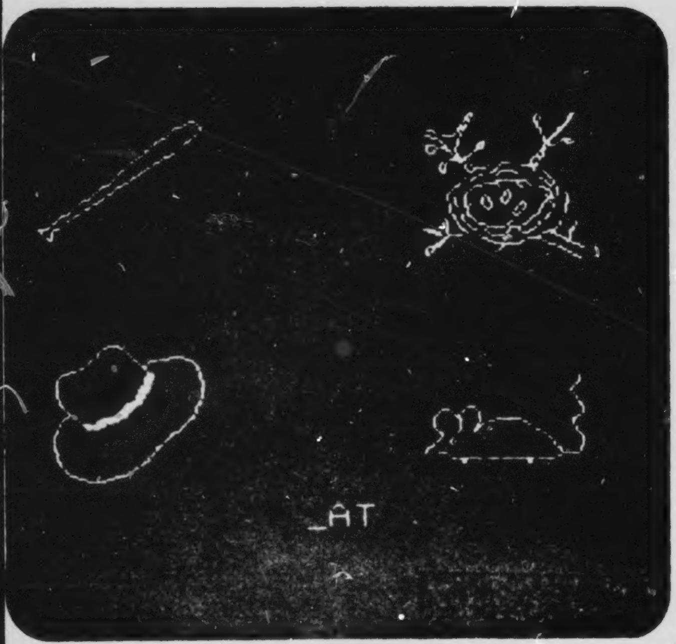

NOW I CAN RHYME increases a child's vocabulary because rhymed words are easy to remember. NOW I CAN RHYME is a unique way to build a child's word list and to assist in memory retention while enhancing creativity. NOW I CAN RHYME requires a minimum of adult supervision and enables a child to progress at his or her own pace

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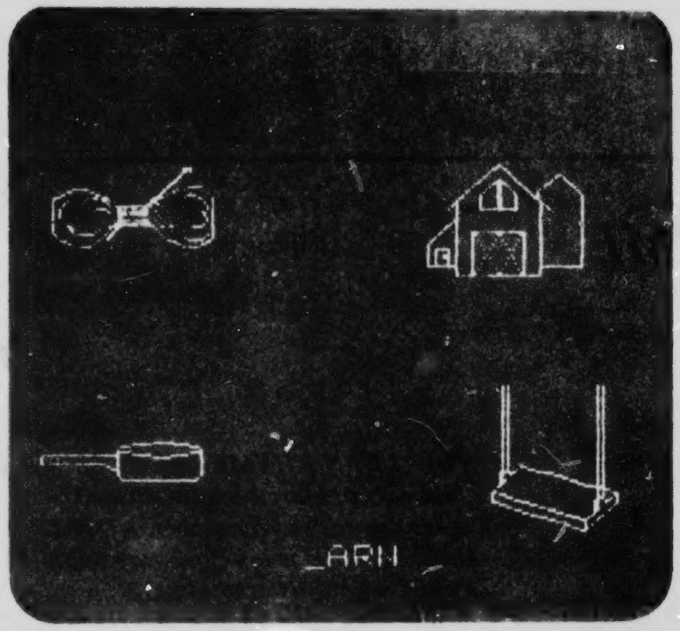

It has been proven that the average person uses only ten percent of his brain power. With SOFTAGON educational systems, children can learn to increase their learning ability – thus increasing the use of the intellect. SOFTAGON's original computer programs stimulate a child's mind at an early age and make learning an enjoyable experience.

Disk $19.95

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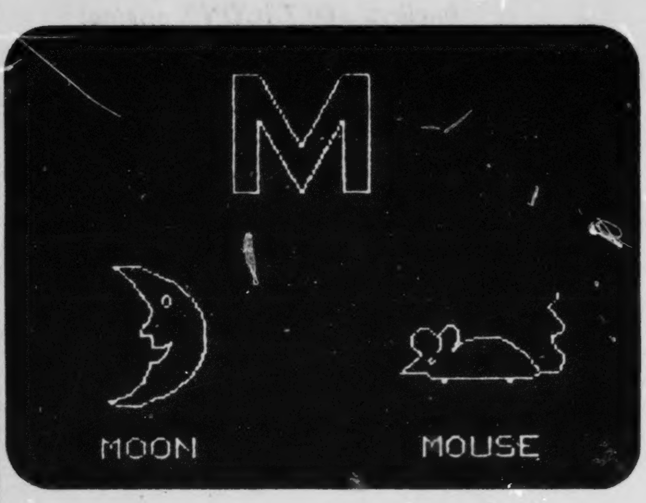
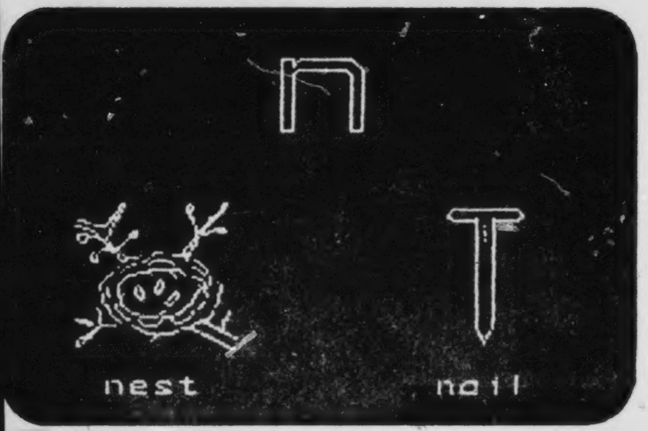
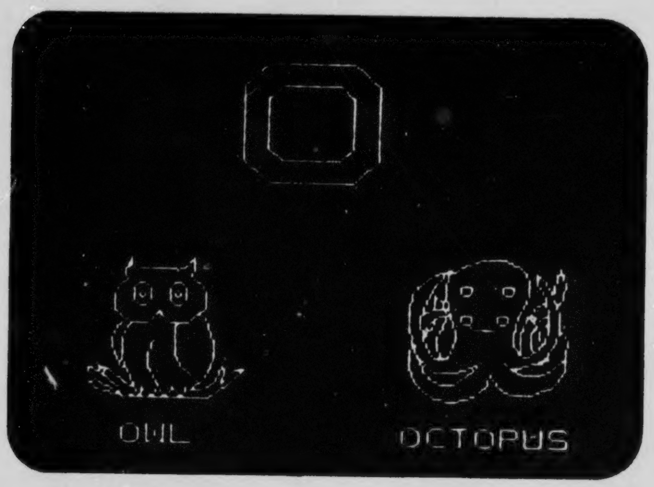
MY ABC's



MY ABC's teaches children – even those with no knowledge of the alphabet – to start developing reading skills. Children get a headstart with my ABC's. MY ABC's increases a child's intellectual capabilities through the use of repetitive word-and-picture association, without adult supervision.



MY ABC's will also benefit the more advanced child in his or her spelling and reading development. SOFTAGON's unique System compliments children's educational t.v. programs and goes even further by allowing chidren to interact directly (by sight and sound) with the System and to progress at their own pace.



It has been proven that the average person uses only ten percent of his brain power. With SOFTAGON educational systems, children can learn to increase their learning ability – thus increasing the use of the intellect. SOFTAGON'S original computer programs stimulate a child's mind at an early age and make learning an enjoyable experience.

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Give your Apple II computer the power of speech!!!
Your programs can now talk to you with spoken words!
Any Apple with 16K of memory or more can use this program.
The APPLETALKER which accepts voice or audio information through the cassette input port digitizes the information and stores it in numbered table in your computer's memory (RAM). The stored information may then be played back using the Apple's on board speaker. You can also SAVE the tables to tape for later use. Audio tables or "Talker Tables" are created using your cassette recorder and microphone.

By using the APPLETALKER subroutine package (written in assembly language) and a few lines of BASIC, you can use the "Talker Tables" you create to give any Apple program the power of speech without hardware costs!

APPLETALKER comes complete with all the routines and instructions you will need. A DEMO program is also supplied. SAVE your APPLETALKER to your Apple diskette.

ATB-778..........$15.95

THE TALKING CALCULATOR

A software program which transforms your Apple II into a talking, 10 digit calculator. This program uses APPLETALKER subroutines (included) and will "say" the answer to math problems as well as print them on the screen. Simply LOAD the TALKING CALCULATOR and discover the real power of your Apple II microcomputer. Great for home, office, or school work. Fixed or floating point addition and subtraction. (16K)

TCB-978..........$12.95

APPLE-LIS'NER

An Apple II Software program which allows you to communicate with the Apple II computer via spoken words requiring no additional hardware. By using your cassette recorder and a microphone, APPLE-LIS'NER will listen for the words or phrases it has learned and respond under program control.

The package is easy to use and comes complete with a "PREFIX" program and all documentation needed to make your own programs with voice recognition.

APPLE-LIS'NER occupies less than 1K of memory for a 31 word vocabulary. It is also compatible with APPLETALKER for real Conversational Software. SAVE your APPLE-LIS'NER to your Apple Diskette.

ALB-978..........$19.95

MUSIC KALEIDOSCOPE

Create a fascinating colour light show using your Apple II computer, Using any audio input to the cassette port, this program will display many coloured patterns for your enjoyment. Each pattern is unique to each input!

Written in machine language for speed, you can use input from your sterc to produce a demonstration unlike any other. Use it at your next party and show your friends the abilities of your computer. MUSIC KALEIDOSCOPE is easy to use and self documenting.

For Both Apple II and Apple II Plus

COB-478..........$9.95

THE SCREEN MACHINE

Open the manual and LOAD the cassette. Then get ready to explore the world of Programmable Characters with the SCREEN MACHINE. You can now create new character sets - foreign alphabets, electronic symbols and even Hi-Res playing cards, or, use the standard upper and lower case ASCII character set.

The "SCREEN MACHINE" lets you redefine any keyboard character. Just create any symbol using a few easy key strokes and the "SCREEN MACHINE" will assign it to the keyboard 'A' key. Now every time you press the 'A' key or when the Apple prints an 'A' it will appear upside down. Any shape can be assigned to any key!

The "SCREEN MACHINE" gives you the option of saving your character symbols to disk or tape for later use. There is no complicated 'patching' needed. The SCREEN MACHINE is transparent to your programs. Just print the new character with a basic print statement. The "SCREEN MACHINE" is very easy to use.

Included on the cassette are Apple Hi-Res routines in SOFTAPES prefix format. You can use both Apple's, routines and the SCREEN MACHINE to create microcomputing's best graphics.

For Both Apple II and Apple II Plus

SMD-289..........$19.95
cassette, and documentation, a complete package

THE ELECTRONIC INDEX-CARD FILE

An Apple II computer program which uses the Apple Disk for storing and retrieving information such as telephone numbers, recipes, etc. The information is stored in alphabetical order on "index-cards", each of which is 40 columns wide by up to 12 lines long!

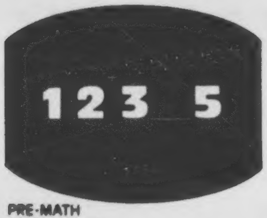
This program is very powerful and easy to use. The program is distributed on cassette. The INSTRUCTION BOOK will explain the use of this program! Instead of using actual 3 x 5 paper index cards, the ELECTRONIC INDEX-CARD FILE uses the Apple Disk to store the information in magnetic form. Your index cards are kept in alphabetical order and finding or changing information is just seconds away!

For Both Apple II and Apple II Plus

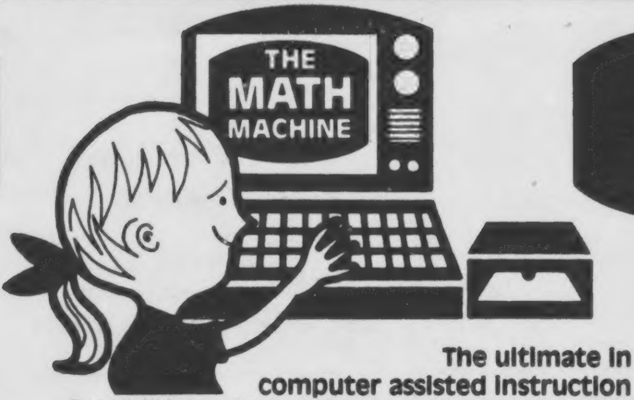
OHS-279..........$14.95

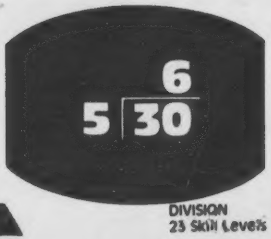
SOFTAPE
10756 Vanowen,
North Hollywood, Ca 91605
U.S.A.

Improve Your Child's MATH Skills

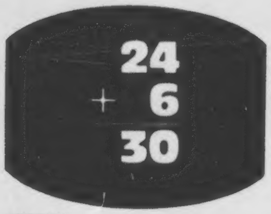


PRE-MATH
19 Skill Levels

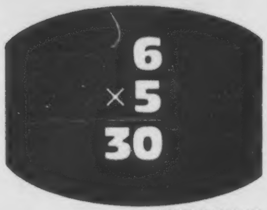




DIVISION
23 Skill Levels



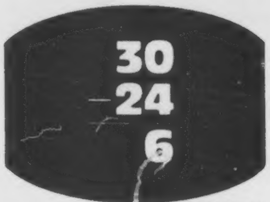
ADDITION
29 Skill Levels



MULTIPLICATION
17 Skill Levels

The ultimate in computer assisted instruction for children. Combines elegant programming with sound educational and psychological content. Proven effective thru controlled experimental study. (Research report provided on request.)

For 32K or 48K APPLE II* with
Applesoft in ROM. 1 disk drive
and color TV or monitor.
(40 Column Printer Optional)



SUBTRACTION
23 Skill Levels

Kid-tested, inexpensive, effective instructional softwear to improve math skills...

- Covers math skills typically taught in kindergarten thru 6th grade classrooms.
- Also beneficial for gifted pre-school children and older students who require remedial assistance.
- Suppliments classroom instruction to improve math computation skills.
- Comprehensive manual guides parents and teachers to quick use.
- Step by step approach individualizes lessons to meet each child's needs.
- Innovative reinforcement system motivates children to succeed.
- Record keeping system allows convenient progress reviews.
- Immediate feedback helps children learn without errors.
- Extensive use of color graphics and sound helps make learning fun.
- Reinforcement games improve eye-hand coordination.
- Includes main and backup diskette in protective holder, 35 page manual, student record forms and 1-year replacement warranty.

SouthWest EdPsych Services
P.O. Box 1870, Phoenix, Arizona 85001
(602) 253-6528

*APPLE is a registered trademark of Apple Computer, Inc.

ORDER FORM

Qty.	Description	Price	Total
____	**THE MATH MACHINE**	**$79.95**	______
	(Arizona Residents)	Tax 5% ______	______
	Please allow two weeks for delivery.	Total ______	______

Name ______________________
(Please Print)

Street ______________________

City, State, Zip ______________________

Signature ______________________

Send check, money order or purchase order to:

SouthWest EdPsych Services
P.O. Box 1870, Phoenix, Arizona 85001 • (602) 253-6528

jem
research
Joint Educational
Management Research

Studying angles and circumferences? Try sharpening your understanding with these effective Geometry and Measurement Drill and Practice programs.

Recommended for students in junior high school and above, the programs test users on areas, perimeters, lengths, angles, polygons, volumes, circles—even on clock time intervals. Material is presented on two separate diskettes, or "volumes," one elementary and one advanced.

You learn fast, because Geometry and Measurement Drill and Practice uses your Apple's high-resolution graphics to emphasize key points, and provides short explanations to help you when you get stuck. And, since you select the drills you want from a menu of options, the program is easy to use, too.

The Geometry and Measurement Drill and Practice program also:

- provides study information, drill options, and correct answers... *so you can use the program as a comprehensive learning tool;*
- lets you select the number of problems you want to attempt... *so you control the time you spend on any single drill;*
- summarizes the number of correct answers on your first and second tries ... *so you can judge your progress.*

It's simple to use Geometry and Measurement Drill and Practice. For instance, suppose you choose the Volume 1 diskette. Its main menu lists the drills focusing on polygons, lengths, perimeters and areas, and clock time. To choose any drill, just type its menu number on your Apple keyboard.

Let's say you choose the Polygon Drill. You can specify the polygon you'd like to be tested on—triangles, for instance—and the number of problems you want to attempt. When you've finished with the drill, your results will be automatically tabulated, summarizing how well you did. Then you'll be able to: 1) repeat the same type of drill (but with different questions); or 2) return to the main menu to try a different type of drill; or 3) stop the program.

The more advanced Volume 2 programs include drills on circles, angles, perimeters/areas, and volumes/areas. If you make a mistake on your first attempt to answer a question, the program provides more assistance.

Geometry and Measurement Drill and Practice is written in Applesoft BASIC. To use it, you'll need:

- an Apple II Plus with at least 32K bytes RAM; or
- an Apple II with 32K bytes RAM and an Applesoft BASIC Firmware Card; or
- an Apple II with the Apple Language System.

Plus:

- Auto-Start ROM;
- a video monitor or television (black & white, or color);
- an Apple Disk II with controller (16-sector PROMs).

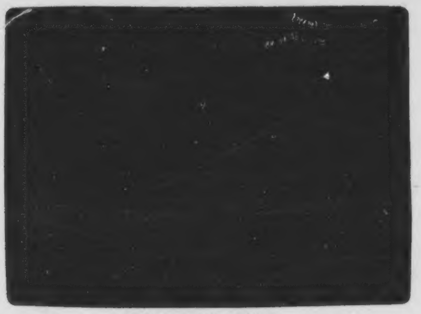
With the Geometry and Measurement Drill and Practice package, you'll receive: 1) Geometry and Measurement Drill and Practice program diskettes (Volumes 1 and 2); 2) user instructions.

Order Number: C2E0002

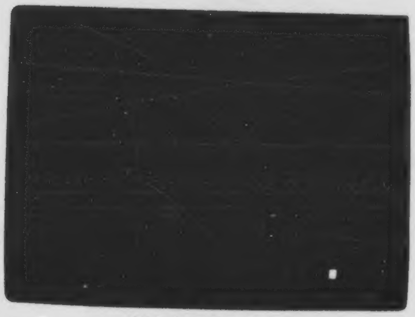
Price: $50.00

SPECIAL DELIVERY SOFTWARE

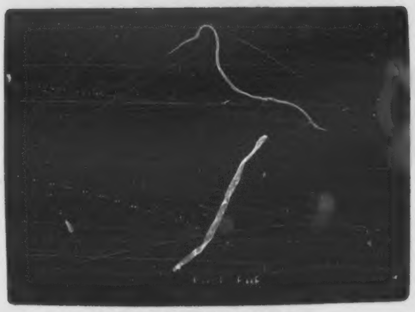
10260 Bandley Drive
Cupertino, CA 95014



Volume 1 Main Menu



High-Res Graphics
Used in Volume Drill



Hi-Res Graphics Used in
Perimeters/Areas Drill

Has the trick of animation been eluding you? Or are you just tired of programming high-resolution shapes in cumbersome assembly language? With the Pascal Animation package you can produce exciting, animated graphics as quickly and as easily as text.

Add life to your graphics! The Pascal Animation Package lets you develop distinctive fonts of graphic shapes or pictures—a horse font, for instance, with stop-action pictures of a horse in various stages of running—then string these "snapshots" together in sequences that mimic movement. This approach also allows you to build a library of useful shapes that can be accessed quickly and used over and over again in your animations.

The Pascal Animation Package:
- lets you use Pascal to write and manipulate programs with complex, animated graphics... *so you save time developing software;*
- allows you to print out high-resolution shapes at text speed... *so you're able to create animations that behave more smoothly and realistically;*
- provides a ready-made, efficient way to create libraries of shapes, many of which can be animated with the same movement codes... *so you reduce software development costs, and manage animation projects more efficiently;*

The Pascal Animation Package uses a special-developed, binary input/output system (BIOS) that knits the Apple's high-resolution screen to its text facilities. This innovation allows you to create a set of images—the shapes of a bird in flight, for example—and treat it exactly like a character font.

In other words, if you let "A" correspond to the bird's "wings up" and "B" to its "wings down" shapes, a Pascal program that printed A, then B, then A, then B (and so on) would result in a bird flapping its wings—slowly or quickly, as wished. Intermediate images could also be added, to make the motion as smooth as desired.

The Pascal Animation Package contains a number of programs, all extremely helpful for programming animated graphics. The Animation program—provided in source code—lets you do character cell animation under control of the Apple's HIRES1 programmable character generator. Seven demonstration programs—provided in source code—are also included in the Pascal Animation Package to illustrate the simplicity and flexibility of Animation.

Another program, "Charedit," is a fast, powerful, high-resolution character editor which you can control either with your Apple's keyboard or game paddles. Teamed up with Animation, "Charedit" lets you use a variety of dramatic animation techniques.

Also included in the package are: two Pascal source programs that provide string to numeric conversions (either real or integer); source code examples showing how to interface the Apple Graphics Tablet to Pascal programs; and a helpful assembly language routine that lets you use Apple's Communications Interface Card to achieve bidirectional (full duplex) communications from Pascal. Detailed source code has been provided in lieu of extensive documentation.

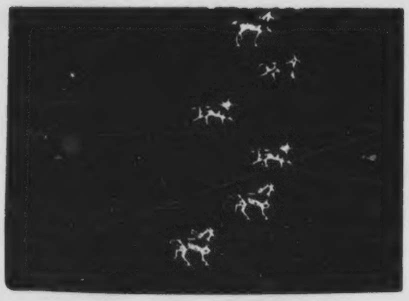
To use the Pascal Animation Package, you'll need:

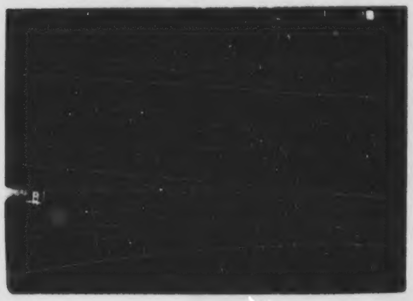
- an Apple II or II Plus with 48K bytes RAM;
- the Apple Language System;
- a video monitor or television;
- an Apple Disk II with controller (16-sector PROMs).

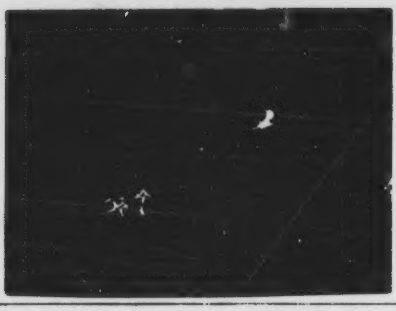
With the Pascal Animation Package, you'll receive: 1) two Pascal Animation Package diskettes; 2) user instructions.

Order Number: C2B0001

Price: $75.00







Looking for a way to express the music in your soul? Roll over, Beethoven! Musicomp provides an electronic music sheet that lets you compose, arrange, store and play your very own tunes, using the Apple's built-in speaker, or an external sound system. Musicomp also turns your Apple II or II Plus into a coin-free "computer jukebox," with 24 sample selections that demonstrate the kinds of compositions you can create with the program.

If you've had any training in music or music theory, you can quickly begin using Musicomp to play, record, and edit your own compositions. And even if you don't have much musical aptitude, you can enjoy Musicomp's pre-programmed tunes, while showing off your Apple in a unique way.

Musicomp:

- lets you edit your compositions note by note... *so you get precisely the music you want;*
- displays each note it plays on a music staff centered on your screen ... *so you learn music symbols as you hear their corresponding sounds;*
- can be connected through the cassette output jack to a stereo system, *letting you use your personal computer to play music, with or without adding expensive equipment.*

Musicomp's *Play* and *Create* options allow you to key in your own music, edit it, store, recall, and play it back. Use your Apple keyboard as you would a piano keyboard—over a full four-octave chromatic range.

In addition to setting key and time signatures, you also set the tone of every piece you create. Musicomp has three "voice" and four "timbre" settings that alter tone, allowing you to arrange as well as compose. One combination of settings produces a tone suggestive of woodwinds, for example, while another combination sounds like a harpsichord.

Musicomp is written in Integer BASIC. To use it, you'll need:

- an Apple II with 32K bytes RAM; or
- an Apple II Plus with 32K bytes RAM and an Integer BASIC Firmware Card; or
- an Apple II Plus with the Apple Language System.

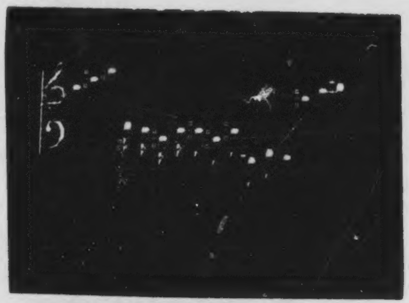
Plus:

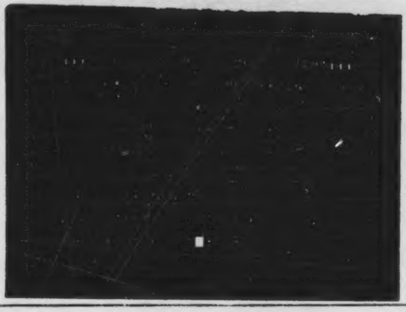
- Auto-Start ROM;
- an Apple Disk II with controller (16-sector PROMs);
- a video monitor or television.

With the Musicomp package, you'll receive: 1) Musicomp program diskette; 2) instructions.

Order Number: C2H0002

Price: $45.00





Set aside your paints, brushes, and canvas—now you can create works of art with your Apple II or II Plus computer! Artist's Designer is an exciting program that makes the most of your Apple's superb color graphics capabilities. Designed by an art instructor for computer art enthusiasts, it lets you "draw" and "paint" virtually any color graphics composition you wish, using your color monitor or color television screen as a "canvas."

Unlike more conventional graphics systems, Artist's Designer produces irregular shapes, curves, and other forms. And you can use colored dots to fill defined areas or to introduce textures. The five vibrant colors at your command—green, yellow, orange, violet, and red—can also be mixed with black or white to produce hundreds of color tints, mixtures, and shades. You can save your masterpieces, too. Up to 35 finished or in-progress compositions fit on a single storage diskette.

One of Artist's Designer's unique features redraws your designs, step-by-step—so you can "re-run" your process of creation and examine the artistic choices you made. This feature can likewise be used to experiment with "art animation," an exciting new performance art.

Artist's Designer also:

- has a special LINK feature that lets you "link together" designs from different storage files . . . *so you can build detailed compositions piece by piece;*
- allows you to create "slideshows" of designs . . . *so you can make tutorial presentations for use in the classroom, office, or anywhere else;*
- provides complete editing capabilities, including selective erase/redraw features . . . *so you save time by refining rather than redrawing compositions;*

Artist's Designer uses menus and display prompting to give you the control you need as an artist. The program's main menu allows you to draw, edit, erase, or save compositions, and to choose or change their background colors.

Once you've made a selection from the main menu, sub-menus let you focus specifically on what you want to do. Selecting *DRAW*, for instance, produces a sub-menu that allows you to draw either with blocks, dots, lines, curves, or semicircles. Other sub-menus let you redraw, edit, fill-in shapes with colors, and link designs stored in separate files.

Artist's Designer comes with 20 predrawn designs, which you can modify and use in your own compositions. A special "playback" feature will redraw successively—and continuously, if you like—up to 25 designs of your choosing. Artist's Designer's Playback feature lets you create a wide range of self-operating displays and exhibitions, without programming a line.

Artist's Designer is written in Apple Pascal. To use the program, you'll need:

- an Apple II or II Plus with 48K bytes RAM;
- the Apple Language System;
- a color video monitor or color television;
- an Apple Disk II with controller (16-sector PROMs).

With the Artist's Designer package, you'll receive: 1) Artist's Designer master diskette, containing modifiable demonstration designs and a disk initialization program; 2) instruction manual.

Order Number: C2H0004

Price: $65.00

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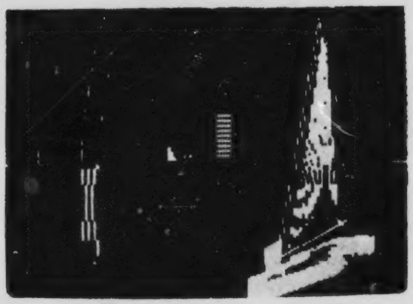

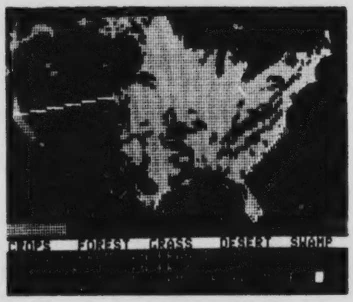

Wish you could make geography more enjoyable and capitals more captivating? Try Supermap, an easy, fun way to learn about the continental Unites States. Simply type in the name of a city. If it's contained in the program's data base (which has over 300 cities), Supermap will show you where the city's located on any one of four, full-color maps, and provide you with some important facts about the city—including population, ZIP code, longitude and latitude.

Supermap also:

- displays the distance between two cities in both miles AND kilometers... *so you become familiar with metric equivalents;*
- puts maps, facts, and figures at your fingertips... *so you save time searching through atlases and almanacs;*
- electronically highlights the locations of cities... *so you're left with a lasting sense of geographic relationships.*

Supermap's main menu lets you choose five options. The State Capital Quiz prompts you with a state name, then waits for you to spell correctly the corresponding capital name. If you're right, Supermap blinks the city's location and beeps that you're correct; if you're wrong, you get two more guesses before Supermap fills you in. A special Scan Cities option lets you run through the entire list of cities in the data base at your own speed, lighting up locations and beeping as you go.

Other options let you view the continental United States in four different ways. The State Map, with the 48 states highlighted in dazzling colors, allows you to study the states in relation to one another. A Features Map displays the five, dominant ecological regions of the U.S.: crops, forest, grasses, desert, and swamp. When you instruct Supermap to locate a city on the Features Map, you'll have a good idea whether its inhabitants grow cactus or cucumbers. The January and July Sun Maps show mean daily solar radiation (in langleys) at ground level during those months.

Supermap is written in Applesoft BASIC. To use it, you'll need:

- an Apple II Plus with 48K bytes RAM; or
- an Apple II with 48K bytes RAM and an Applesoft Firmware Card; or
- an Apple II with the Apple Language System.

Plus:

- Auto-Start ROM;
- an Apple Disk II with controller (16-sector PROMs);
- a video monitor or television (color recommended).

With the Supermap package, you'll receive: 1) Supermap program diskette; 2) instructions.

Order Number: C2E0003

Price: $35.00

Discovery Park
University of Victoria
P.O. Box 1700
Victoria, B.C. V8W 2Y2
Tel. (604) 477-7246

Mathematics Series

If you're a student, teacher, mathematician, engineer or scientist in search of mathematical analysis routines, this package is for you. Elegantly written and user-oriented, this group of four programs makes maximal use of Apple's HI-Resolution plotting capabilities to augment math routines and display the results. The program contains a master menu to run any one of the following programs:

Statistical Analysis I: This is a general purpose menu-driven statistics package that allows the user to analyze numerical data bases. The program computes and displays:

- Mean
- Standard Deviation
- Frequency Distribution Plot
- Simple Linear Regression Line
- SLR Equation Co-efficient
- Data Points

Included are routines for disk data file I/O, editing and printer output.

Numerical Analysis: This program will plot any two variable equations that you can write using standard Basic arithmetic functions. The program will plot the equation, its integral, and its derivative. It will determine and list roots, maxima or minima encountered and the integral value over the plot range.

Matrix: This program allows you to solve for the inverse, determinant and solution matrix for linear systems of up to 54 equations in 54 unknowns. It uses standard Gauss elimination with pivoting for maximum efficiency. Included are standard data base management routines for editing, disk I/O and printer reports of both data and results.

3D Surface Plotter: Ever wonder what a Black Hole's local field looks like? You can plot it in 3 dimensions with this program. This program does general purpose 3-D plotting of any 3 variable

3 variable equations that you can write using standard Basic arithmetic functions. It performs either hidden-line or transparent plots. Disk I/O routines are included for saving plot pictures on diskette.

The programs are all menu-driven and employ extensive prompting for ease of use. The entire series of programs is supplied on a single disk together with demos and an instruction manual. For Apple only.

Order No.: AM-0001 **PRICE: $49.95**

MAR 31

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SOFTWARE

142 Carlow, P.O. Box 2084
Sunnyvale, CA 94087

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Management Research

Courseware for Computer Literacy

NEW Courseware for Computer Literacy

An introductory package of computer literacy materials for Junior and Senior High School students.

COMPUTER DISCOVERY

A program to introduce students in junior and senior high school to basic computer concepts. No prior knowledge of computers is required. Student workbook contains introductory text and exercises in the areas of computer history, computer hardware and software concepts, analysis and programming, and the social and economic impacts of computers. The program permits a great deal of interaction between the students and the computer, using computer programs that are included (on diskettes or cassettes) with the Instructor's Guide. Instructor's Guide also includes educational objectives on which a more advanced curriculum may be based, lists of references and resources, and project suggestions. Student Workbook is available at your choice of difficulty levels: junior high school and senior high school.

Components Instructor's Guide, Diskettes or Cassettes, Student Workbook.

Equipment You will need an Atari* 400A* or 800* Personal Computer System with disk drive or program cassette recorder or an Apple† II system with disk drive.

		License Fee
6-3100	Computer Discovery Program, Junior High (Atari*/Diskettes)	$195.00
6-3101	Computer Discovery Program, Junior High (Apple†/Diskettes)	195.00
6-3106	Computer Discovery Program, Junior High (Atari*/Cassettes)	195.00
6-5100	Computer Discovery Program, Senior High (Atari*/Diskettes)	195.00
6-5101	Computer Discovery Program, Senior High (Apple†/Diskettes)	195.00
6-5106	Computer Discovery Program, Senior High (Atari*/Cassettes)	195.00

The Computer Discovery Program, Junior High and Senior High (listed above), consists of a set of 2 diskettes for either the Atari* or Apple†, or a set of 10 Atari* cassettes, plus 30 student workbooks, and an Instructor's Guide.

6-100	Computer Discovery Atari*/Diskettes (set of 2 diskettes only)	125.00
6-101	Computer Discovery Apple†/Diskettes (set of 2 diskettes only)	125.00
6-106	Computer Discovery Atari*/Cassettes (set of 10 cassettes only)	125.00
6-40102	Junior High Student Workbook (set of 30)	88.50
6-40103	Senior High Student Workbook (set of 30)	88.50
6-102	Junior High Student Workbook, each	3.25
6-103	Senior High Student Workbook, each	3.25
6-105	Instructor's Guide	Please write for fee.

Planned availability: October, 1980.

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NEW Courseware for Remedial Mathematics

Designed to test for learning objectives normally taught in grades 1-8, suitable for remedial work in any grade.

CLASSROOM MANAGEMENT SYSTEM: MATHEMATICS

A system for diagnosing, prescribing, and recordkeeping in mathematics. The CMS program administers broad survey tests covering major curriculum objectives. Student errors on survey tests lead to more detailed diagnostic tests to pinpoint areas of weakness. Then the computer prints out a prescription with specific page references to the texts, kits, and other learning materials in *your* classroom that will help teach or reinforce the skills needed. Students work with these materials, then return to the system. Computer rechecks to see if the skills have been mastered and records each student's progress.

The computer generates the following reports for the teacher: Class Record, showing every student's current position — work completed, work remaining; Grouping Report, listing every student working on the same skill at the same time; Short Student Report, giving more detailed information on each student than Class Record provides; Full Student Report, identifying each student's progress in a given skill area; Class Lists.

Skills Coverage

Math, Level A. Basic concepts of Whole Numbers; Addition and Subtraction of Whole Numbers; Problem Solving; Measurement; Time; Money; and Geometry.
Math, Level B. Basic concepts of and operations with Whole Numbers, Fractions, Decimals and Percents; Problem Solving; Measurement; Geometry; Applications; Probability; and Statistics.

Components Each level consists of a Binder containing Diskettes and a Teacher's Handbook.

Equipment You will need an Atari* 800* Personal Computer System with disk drive, printer, and additional memory modules or an Apple† II system similarly equipped.

For Atari* Users	For Apple† II Users		License Fee
6-1000	6-1100	CMS: Mathematics, Level A	Please write for fees.
6-2000	6-2100	CMS: Mathematics, Level B	$595.00

Planned availability:
Mathematics A and B — Fall, 1980.
Please write for license fees.

*Trademarks of Atari, Inc.
†Trademark of Apple Computer, Inc.

NEW Courseware for Remedial Mathematics

Designed for drill and instruction on objectives normally taught in grades 1-8, suitable for remedial work in any grade.

SRA COMPUTER DRILL AND INSTRUCTION: MATHEMATICS

A program of basic mathematics drill. "Managed Version" of system measures student's current performance and automatically moves student ahead or back as appropriate. (But you can bypass the automated system if you choose.) "Help" feature permits student to call up a step-by-step explanation of any problem simply by striking the ? key.

Management diskette stores data on completed lessons for a classroom of students and can generate a variety of class and individual reports. Permanent records can be printed out if system includes a printer. With printer you can also use the system to generate exercise sheets for homework or seatwork.

"Unmanaged Version" is also available. This version offers the "Help" feature but does not keep records or move students from lesson to lesson automatically.

Optional features include sound effects to reward good work and passwords for privacy.

Skills Coverage Level A includes the appropriate skills of Numeration, Addition, and Subtraction. Level B extends Level A skills and includes Multiplication, Division, and Fractions. Level C extends Level B skills and includes Decimals.

Components Each level consists of a Binder containing Diskettes and a Teacher's Guide.

Equipment You will need an Atari* 800* Personal Computer System with disk drive and additional memory modules or an Apple† II system similarly equipped. Printer not required, but useful for printed records and exercise sheets.

For Atari* Users	For Apple† II Users		License Fee
6-1202	6-1302	Managed Version: Level A	$325.00
6-1204	6-1304	Managed Version: Level B	425.00
6-1206	6-1306	Managed Version: Level C	475.00
6-1203	6-1303	Unmanaged Version: Level A	$250.00
6-1205	6-1305	Unmanaged Version: Level B	350.00
6-1207	6-1307	Unmanaged Version: Level C	400.00

Planned availability: Level A (both versions), February, 1981. Level B (both versions), December, 1980. Level C (both versions), September, 1980.

SRA COMPUTER DRILL AND INSTRUCTION: FACT TRACK

A program of timed drill on Addition, Subtraction, Multiplication, and Division facts, designed to build speed and accuracy. Student or teacher selects skill area, difficulty level, and type of timed drill. Drills may be in a race format in which student competes against time or another student, or in a noncompetitive format. Computer reports student speed and performance, showing which facts merit further practice.

Skills Coverage The Addition, Subtraction, Multiplication, and Division Facts; Mixed Practice with these facts; and Extension Skills (such as multiplying by 10).

Components Binder containing Diskette and Teacher's Guide.

Equipment You will need an Atari* 800* Personal Computer System with disk drive and additional memory modules or an Apple† II system similarly equipped.

For Atari* Users	For Apple† II Users		License Fee
6-1400	6-1450	Fact Track	$75.00

Planned availability: October, 1980.

NEW

Courseware for Remedial Mathematics

Designed for drill and objectives normally taught in grades 1-8, suitable for remedial work in any grade.

SRA COMPUTER DRILL AND INSTRUCTION: ARITHMETIC GAMES

A set of six games for one or two players. Players use basic computational skills in a competitive setting and can choose easy or harder versions of each game.

Skills Coverage Basic Computational Skills.

Components For each set of two games, there is a Binder with Diskette and Teacher's Guide.

Equipment You will need an Atari* 800* Personal Computer System with disk drive and additional memory modules or an Apple† II system similarly equipped.

For Atari* Users	For Apple† II Users		License Fee
6-1511	6-1561	Arithmetic Games, Set 1 (2 games)	$50.00
6-1512	6-1562	Arithmetic Games, Set 2 (2 games)	50.00
6-1513	6-1563	Arithmetic Games, Set 3 (2 games)	50.00
6-1500	6-1550	Arithmetic Games, Complete Set	120.00

Planned availability: Set 1, September, 1980. Set 2, December, 1980. Set 3, and Complete Set, February, 1981.

NEW Courseware for Remedial Reading

Designed for drill and instruction in grades 1-8, suitable for remedial work in any grade.

SRA COMPUTER DRILL AND INSTRUCTION: PHONICS

A program of instruction and practice in major phonic elements. Cassette-based soundtrack provides real human speech rather than synthesized speech, for natural, normal sound.

Skills Coverage Initial Consonants; Short Vowels; Final Consonants; Initial Consonant Blends; Final Consonant Blends; Long Vowels; Consonant Digraphs; Vowel Digraphs; Controlled Vowels, Silent Letters, and Inflections.

Components Nine Binders containing Cassettes and Teacher's Handbook. (Binders available separately or as complete program.)

Equipment You will need an Atari* 400A* or 800* Personal Computer System with program cassette recorder.

Planned availability:
September, 1980 — March, 1981. Please write for license fees.

SRA Educational Courseware is available under a license agreement rather than through sale. Customers obtain the right to possess and use SRA Educational Courseware by paying a license fee and agreeing to the provisions of SRA's Courseware License Agreement. Ask your SRA Representative for details.

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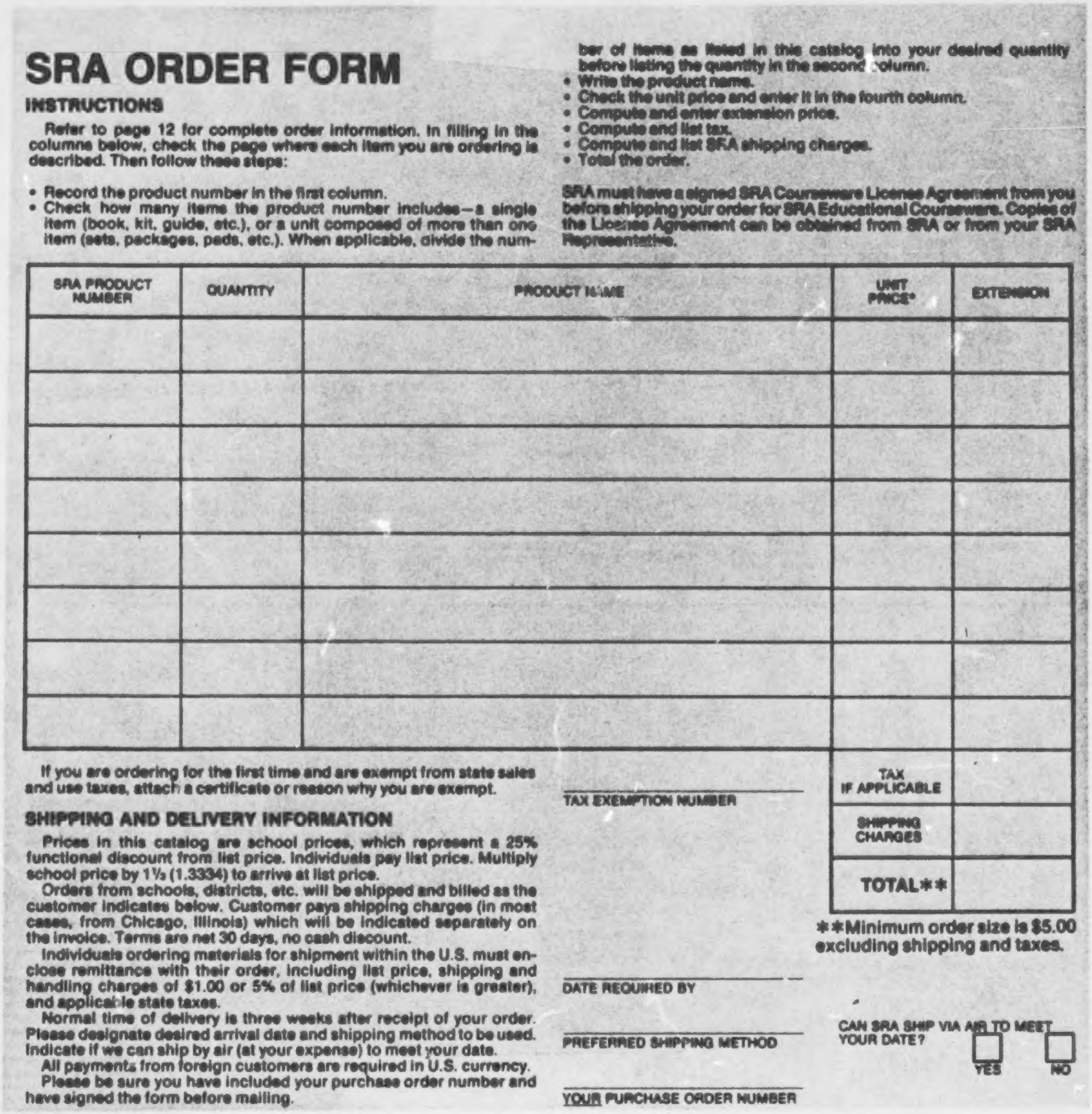
*Trademarks of Atari, Inc.
†Trademark of Apple Computer, Inc.



SRA ORDER FORM

INSTRUCTIONS

Refer to page 12 for complete order information. In filling in the columns below, check the page where each item you are ordering is described. Then follow these steps:

- Record the product number in the first column.
- Check how many items the product number includes—a single item (book, kit, guide, etc.), or a unit composed of more than one item (sets, packages, pads, etc.). When applicable, divide the number of items as listed in this catalog into your desired quantity before listing the quantity in the second column.
- Write the product name.
- Check the unit price and enter it in the fourth column.
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- Compute and list tax.
- Compute and list SRA shipping charges.
- Total the order.

SRA must have a signed SRA Courseware License Agreement from you before shipping your order for SRA Educational Courseware. Copies of the License Agreement can be obtained from SRA or from your SRA Representative.

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**Minimum order size is $5.00 excluding shipping and taxes.

If you are ordering for the first time and are exempt from state sales and use taxes, attach a certificate or reason why you are exempt.

TAX EXEMPTION NUMBER

SHIPPING AND DELIVERY INFORMATION

Prices in this catalog are school prices, which represent a 25% functional discount from list price. Individuals pay list price. Multiply school price by 1⅓ (1.3334) to arrive at list price.

Orders from schools, districts, etc. will be shipped and billed as the customer indicates below. Customer pays shipping charges (in most cases, from Chicago, Illinois) which will be indicated separately on the invoice. Terms are net 30 days, no cash discount.

Individuals ordering materials for shipment within the U.S. must enclose remittance with their order, including list price, shipping and handling charges of $1.00 or 5% of list price (whichever is greater), and applicable state taxes.

Normal time of delivery is three weeks after receipt of your order. Please designate desired arrival date and shipping method to be used. Indicate if we can ship by air (at your expense) to meet your date.

All payments from foreign customers are required in U.S. currency.

Please be sure you have included your purchase order number and have signed the form before mailing.

DATE REQUIRED BY

PREFERRED SHIPPING METHOD

YOUR PURCHASE ORDER NUMBER

CAN SRA SHIP VIA AIR TO MEET YOUR DATE? ☐ YES ☐ NO

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- ☐ ____ copies of the 1981 Social Studies Catalog (Grades 7-12)
- ☐ ____ copies of the 1981 Business, Technology, and Driver Education Catalog (Grades 7-12)
- ☐ Please have my SRA Representative contact me.

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All orders are offers to purchase subject to acceptance or rejection by SRA in Chicago, Illinois, in accordance with SRA's published terms and conditions of sale or rental.

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ORDERING INFORMATION

Cassettes: Order by the package number given on the bottom of page 1. The cost is $12.95 per cassette.

Diskettes: Order one or more packages for the same computer, at $12.95 per package. Then add $5 for the disk. (Single-drive TRS-80 users: We are not permitted to copy TRS-DOS on our disks. You must either send an additional $12.95 for a TRS-DOS disk, or send us a disk of your own on which we will record your programs. The $5 disk charge still applies.)

Shipping: We will ship your order promptly via U. S. Mail. Add $1.00 shipping and handling for orders shipped within North America, and $3.50 for orders shipped outside North America.

Payment: Individuals must include the payment with the order. Schools should either include payment or send a valid purchase order. We will bill when we ship.

Guarantee: All tapes and disks are checked before shipment. We guarantee that they will load and run properly. Contact us in case of difficulty; we'll make sure the problem is resolved to your satisfaction.

Speed Drill

(For 16K Apple II or 4K Level II TRS-80)

This program provides drill on the number facts, in a format that makes it fun in either the classroom or the home. The program will drill youngsters on their number facts for any of the four arithmetic operations or for mixed operations. It will also drill algebra students on the same operations, using both positive and negative integers. The score in each game is based on the player's speed and accuracy. It's fun to play, and students like to try to improve their scores. It's an excellent aid in lower grades, and in algebra classes in high school. It's also excellent for remedial work; students enjoy the change in format from their regular work.

And yes, it is possible to score 100--but it will take you lots of practice!

Reverse

(For 16K Apple II)

This program plays an educational strategy game, using a list of digits. At the beginning of the game, the digits are scrambled. The object is to get them in order through a series of moves called "reverses". The game can be surprisingly challenging; as players improve, they discover first one strategy and then an even better one--but each game remains a challenge. The sound and graphics add considerably to the fun.

Simulated Computer

(For 16K Apple II or 16K Level II TRS-80)

This program simulates the operation of a small machine-language computer. The video screen becomes a computer: the internal registers and all 20 memory locations are displayed on the screen. You can input programs, run them, single-step them--and see the results of every machine cycle on the screen.

The ten different instructions available permit the writing of a surprising variety of programs. The computer can be single-stepped, run at a speed chosen by the user, or run at full speed. A "display" option causes the computer to display a message describing what it is about to do, just before it executes each machine cycle. There are eight different error messages to help the user debug programs. A simulated "break" key is provided, and the full documentation can be reviewed just by typing "HELP". The program comes with a five-lesson tutorial and a complete manual. Permission is granted to duplicate the manual (not the program) for classroom use.

This program is an excellent introduction for an individual or a class. One can learn the principles of the operation of a computer and of machine-language programming, in a realistic setting, without the necessity of learning hexadecimal notation, an instruction set containing scores of instructions, etc.

(continued)

SIMULATED COMPUTER (continued)

According to Creative Computing (Sept. 1980), "Both beginners and old pros will be fascinated by this internal view of a computer in action. SIMULATED COMPUTER is a good first step on the way to understanding a Z-80 or a 6502 micro-processor."

Flight Vector

(For 48K Apple II with disk)

Here is a complete package, consisting of tutorial and game, to teach students about vectors and the composition (combining) of vectors. The program is divided into two parts: ground instruction and flight tests. The parts can be done in any order. In the ground instruction, the student is given brief descriptions of vectors and how they combine, and is encouraged to experiment with the magnitude and direction of the vectors by using the paddles. Thoughout the ground instruction, reading is minimized, and experimentation with vectors and the composition of vectors is maximized.

The flight test part of the program is divided into five different flight tests. In each, the student controls the magnitude and direction of the velocity of an airplane. The object is to fly the plane from one airport to another, taking into account the effect of the wind on the plane's velocity vector. As the student progresses from one test to the next, the pace of the game increases, the wind conditions become more difficult, and the constraints on the route to be followed become more severe. A student who completes all five tests will have an excellent intuitive understanding of how vectors combine. The high-resolution color graphics display includes a display of the airplane velocity vector, a display of the wind velocity vector, a display area where the resultant of these two vectors is constructed, and a map which shows the progress of the plane.

Originally developed for a science museum, this program is suited for use in a home, school or museum. If the user leaves, even in the middle of a game, the program will return itself to the attract mode, ready to accept a new user.

Fraction Recognition

(For 16K Apple II)

This program makes extensive use of high-resolution graphics, color and sound to teach a student to recognize fractions. Each problem is displayed as a rectangle, parts of which are shaded. The student is asked to count the number of parts in the whole box, and then to count the number of parts that are shaded.

(continued)

FRACTION RECOGNITION (continued)
If a student does well, the terms "numerator" and "denominator" are introduced. If the student continues to do well, the problem display changes to a series of rectangles, some of which are shaded and some of which are not. Any time the student makes a mistake, the computer counts the appropriate parts of the display by placing numbers within those parts and beeping as it counts. The high-res graphics, color, sound, and use of upper and lower case letters on the high-res screen make this a most attractive program. With it, four-year-olds can be taught to recognize fractions, and remedial high-school students will enjoy learning a topic they long ago learned to hate.

Guess the Number

(For 16K Apple II or 4K TRS-80)

This program plays an educational game which helps youngsters to recognize the relative size of different numbers. The computer thinks of a number between 1 and 500, and asks the player to guess it. The guess then"sinks" or "floats" depending on whether it's too large or too small. The speed of the sinking or floating depends on how close the guess is to the secret number. When the number is finally guessed, the screen and speaker (Apple only) go wild!

Guess the Rule

(For 16K Apple II or 16K Level II TRS-80)

This program plays an algebra guessing game, in an arcade-style format. The object is to guess the computer's secret equation, which is hidden in a box on the screen. The computer gives hints in the form of ordered pairs that satisfy the equation. The player can score points either by guessing additional ordered pairs, or by guessing the rule itself. The game can be played at eleven different levels of difficulty. The secret equations range from equations like $y = x + 5$, which is easy enough for an elementary school student to play successfully, to equations like $y = 3x^2 - 8x + 7$, which present a real challenge to college students and even to high school math teachers. This game helps develop the concept of a function, and familiarizes students with ordered pairs and with tables of values. It also builds skill in arithmetic, in writing equations, and in logical thinking. Besides all that, it's fun!

Alphabet

(For 16K Apple II)

Make your Apple dance and sing! Press the keys, and the letters of the alphabet appear in vivid color while the Apple sings the alphabet song. At the end, the computer plays the whole song through again and then is ready to start over. You get different colors every time it plays. (Alphabet also works on a black-and-white set.) This program provides terrific reinforcement for youngsters who are just learning the letters of the alphabet, and it even has a repeat feature to help them when they get stuck. It can also be used to help a child learn to type. But mostly, it's just a fun game for kids from 8 to 83!

Number Line

(For 16K Apple II)

This program teaches the addition and subtraction of positive and negative numbers. It can be used to introduce students to the topic, to give beginning students practice and instruction, or to provide extra help and a novel approach to students who are having difficulty. The student chooses addition, subtraction, or mixed problems. If the student misses an addition problem, the correct solution is demonstrated on the number line, using a beeping arrow and flashing numbers. If the student misses a subtraction problem, the student is helped to change it into an addition problem, and is then given another chance at solving it. If the answer is still wrong, the correct solution is demonstrated on the number line. The program comes with detailed suggestions for use in the classroom. The graphics and sound used in NUMBER LINE make it an exciting aid in any math classroom.

Plot

(For 16K Apple II or 16K Level II TRS-80)

This program displays a graph of any function you choose. For comparison, one graph after another can be plotted on the same axes. The user can choose the limits of the axes. There are special provisions for graphing simultaneous equations and conic sections. On a color monitor (Apple II only), the graphs alternate among the four high-resolution colors. The teacher

(continued)

PLOT (continued)
can use the program to demonstrate various types of graphs to an entire class, or an individual student can use it to investigate the behavior of functions or to check homework. This program comes with detailed suggestions for applications in the classroom.

Character Generator

(For 16K Apple II)

This utility program allows you to put text on the Apple's high-resolution screen. The character generator becomes part of your own BASIC program, and will be saved automatically on disk or tape with the program. Once the character generator is incorporated into a program, you can use normal PRINT instructions to place text on the screen. The character generator provides both upper case and lower case with descenders, using an n x 9 matrix. Special features include proportional spacing, the ability to place letters in any desired position on the screen, and letters which appear white even on a color screen.
(continued)

CHARACTER GENERATOR (continued)
The high-res screen will hold 17 lines of about 35 characters each, providing for clear readability. You can shift between upper and lower case, or use the shift lock feature, by embedding control characters within the string to be printed. A sophisticated character design program is included, to permit you to design your own characters, using your own font or using color if you like. The character generator and table occupies about 1.5K of memory.

Compare the competition, and you'll find that our character generator provides features that are missing from other programs with much higher price tags.

EDU-SOFT programs are sold in packages, not individually. The available packages are shown below. For ordering information, see page 2.

Apple Packages:
- A-01--Speed Drill, Number Line
- A-02--Alphabet, Guess the Number, and Reverse
- A-03--Plot, Guess the Rule
- A-04--Simulated Computer
- A-05--Fraction Recognition, Mixed Number Recognition
- A-06--Flight Vector
- A-07--Character Generator

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	Quant	Pkg. No.	Programs	Unit Price	Price
APPLE II		A-01	Speed Drill, Number Line	$12.95	
		A-02	Alphabet, Guess the No., Reverse	$12.95	
		A-03	Plot, Guess the Rule	$12.95	
		A-04	Simulated Computer	$12.95	
		A-05	Fraction Recog., Mixed Number Recog.	$12.95	
		A-06	Flight Vector (48K disk)	$12.95	
		A-07	Character Generator	$12.95	
TRS-80					
		T-01	Speed Drl., Guess the No., Arith. Drl.	$12.95	
		T-02	Addition Drill, Multiplication Drill	$12.95	
		T-03	Plot, Guess the Rule	$12.95	
		T-04	Simulated Computer, Computa-Doodle	$12.95	
		T-05	Integers, Estimation Drill	$12.95	

Subtotal	
Disk charge ($5 each)	
Shipping & Handling	$1.00
6% Sales Tax (Pa. residents)	
Total	

Programs are normally shipped on cassette tape. We will ship all or part of your order on floppy diskette, for an extra charge of $5. Just check the box below. (Single-drive TRS-80 users: be sure to to check the note on page 2; we cannot send you TRS-DOS.)

☐ Yes, send my order on diskette.

Shipping & handling for orders outside North America: $3.50

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Purchase Order No. ______________________

SubLOGIC announces availability of A2-3D1 Animation Package for Apple II.

The A2-3D1 is a package of sophisticated yet easy-to-use programs for 3D and 2D animation on the Apple II microcomputer. The A2-3D1 is designed to accommodate the graphic needs of both new and experienced programmers. With it, you can create two- or three-dimensional scenes in the standard XYZ coordinate system and view them at any angle from different locations in space.

You may specify your own scenes consisting of points and lines by giving XYZ coordinates of points and line end points. Coordinate values within a ±32767 unit range may be entered and stored. Viewing location (XYZ) may be specified within a ±32767 range, and you have full-circle viewing freedom of pitch, bank, and heading. A variable field of view feature lets you adjust your field of view and "zoom in" on objects in a camera-like fashion.

A set of control programs is provided to give you unlimited utility in your educational, scientific, and game applications. These programs help you to create scenes and allow you to move dynamically through 3D space as follows:

You receive five sample data bases to view during familiarization. After familiarization, you may enter your own data bases as the "data base development program" requests. You may view your creations from different angles at any time during the development, and a "view finder program" helps find scenes as you move freely in 3D space. Scenes can be saved on cassette or disk. Data base relocation instructions let you move data bases in memory and thereby eliminate scene re-entry because of system or program change.

The movement program examples included allow you to change your location and viewing direction dynamically. Your scene will be viewed as you move through 3D space. A special subroutine is included that allows you to orbit your scene.

Projection rates of 150 lines per second in the unclipped mode and 100 lines per second in the clipped mode are possible. A 42 millisecond screen erase subroutine is included in the package. A 20-line drawing will be presented at about 5 frames per second in the unclipped mode. If you are doing complex calculations of location and viewing angle, then the program speed will be reduced accordingly.

Two manuals which are written at different technical levels give all Apple users a quick understanding of access and uses from both assembly language and BASIC language levels.

The 32-page Load and Go Manual guides you through an orientation session with the A2-3D1 program. Load the 3D-2D transformer, load the DEVELOP program, and view the scene waiting for you. The manual will show you how to change location and direction of view one step at a time and dynamically.

The Load and Go Manual will also guide you through data base development by discussing how to create and enter your own data bases.

The 84-page Technical Manual, for advanced applications, describes the 3D-2D transformer algorithm in depth. Patchpoints and methods for hardware multiply, data input, and data output are described also, as well as special features of the package.

The package price with cassette is $45. Add $10 for the disk option. Both media are usable with the Apple Plus. The animation package is available from your dealer. If he doesn't stock it, order direct from SubLOGIC, Box V, Savoy, IL 61874. Add 75¢ for UPS or $1.50 for first class mail.

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Apple II Animation Package

(3D Graphics, Assembly Language Version)

Hardware Requirements

Apple II microcomputer and video monitor.

Memory Requirements

16K minimum for 3D to 2D transformer, small scenes, and small control programs.

24K minimum for larger scenes, control programs, and the DEVELOP program.

Product Format

Apple cassette (standard) or Apple disk (optional)

Documentation

32 page user's manual, 84 page technical manual.

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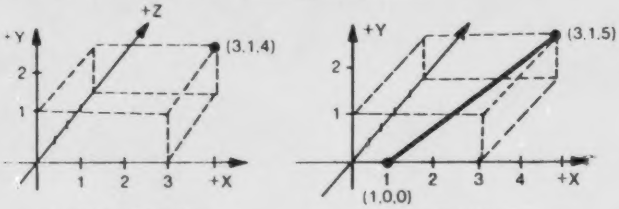
The A2-3D1 is a package of sophisticated yet easy-to-use programs for 3D and 2D animation on the Apple II microcomputer. The A2-3D1 is designed to accommodate the graphic needs of both new and experienced programmers. With it, you can:

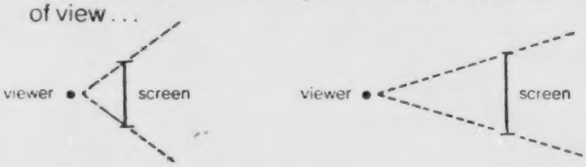
a) View two- or three-dimensional scenes created in the standard XYZ coordinate system . . .


+Z
+Y
2
1
(3,1,4)
1
2
3
+X
+Y
(3,1,5)
2
1
1
2
3
4
+X
(1,0,0)

a) A point in 3D space

b) A line in 3D space

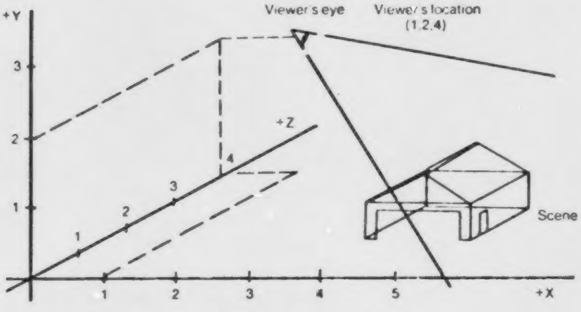
b) "Zoom" between wide angle and telephoto fields of view . . .


viewer
screen
viewer
screen

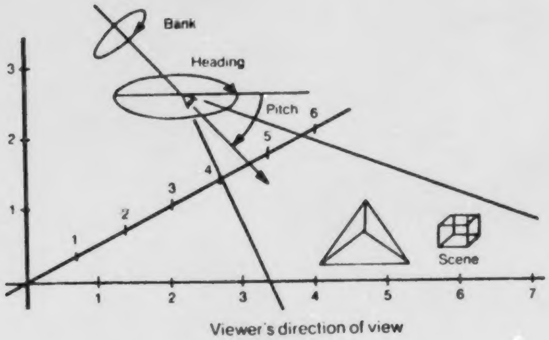
a) wide view AZR=32767

b) narrow view AZR=8192

c) Select a location in space and a direction of view.


+Y
3
2
1
Viewer's eye
Viewer's location
(1,2,4)
+Z
4
3
2
1
Scene
1
2
3
4
5
+X

Viewer's location in space



Standard Features

The A2-3D1 program rates "high" in a number of respects: high resolution, high projection rate, high versatility, high control. And the extensive documentation makes it highly easy to use.

Resolution. You'll have 140 x 192 high resolution on the Apple II as your scenes appear on its screen.

Speed. Projection rates of 150 lines per second in the unclipped mode and 100 lines per second in the clipped mode are possible. A 42 millisecond screen erase subroutine is included in the package. A 20-line drawing will be presented at about 5 frames per second in the unclipped mode. If you are doing complex calculations of location and viewing angle, then the program speed will be reduced accordingly.

Versatility. You may specify your own scenes consisting of points and lines by giving XYZ coordinates of points and line end points. Coordinate values within a ±32767 unit range may be entered and stored. Viewing location (XYZ) may be specified within a ±32767 range, and you have full-circle viewing freedom of pitch, bank, and heading. A variable field of view feature lets you adjust your field of view and "zoom in" on objects in a camera-like fashion.

Control. A set of control programs is provided to give you unlimited utility in your educational, scientific, and game applications. These programs help you to create scenes and allow you to move dynamically through 3D space as follows:

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Utility. Two manuals which are written at different technical levels give all Apple users a quick understanding of access and uses from both assembly language and BASIC language levels.

The **Load and Go Manual** guides you through an orientation session with the A2-3D1 program. Load the 3D-2D transformer, load the DEVELOP program, and view the scene waiting for you. The manual will show you how to change location and direction of view one step at a time and dynamically.

The load and go manual will also guide you through data base development by discussing how to create and enter your own data bases.

The **Technical Manual**, for advanced applications, describes the 3D-2D transformer algorithm in depth. Patchpoints and methods for hardware multiply, data input, and data output are described also, as well as special features of the package.

We recommend that new programmers learn the following BASIC statements:

=, CALL, FOR - NEXT, GOSUB, GOTO, IF - THEN, POKE.

Summary of Commands

Plot 2D Point
Draw 2D Line from Point 1 to 2
Viewer's XYZ, PBH
Define 3D Point
Define 3D Start Point
Define 3D Continue Point
Define 3D Ray
Clipper Control Switch
Display Screen Select
Write Screen Select
Erase Screen
Interpretive Jump
Set Line Drawing Mode
Turn On Output Array Generation
Screen Size Selection
Field of View Selection
Easy Initialize
No Operation

Special Features

- An array generating feature lets you generate an output array of line start and end points instead of plotting on the Apple screen. This array will let you use the program with future graphic output devices.
- A "zero page restore" feature leaves all of your zero page variables intact after subroutine exit.
- The page control feature allows selective page erase, display, and draw for ping-ponging between screens. This permits smooth animation.
- The selective erase feature allows movement of objects without erasing the full screen.
- The A2-3D1 is given in two different memory locations (2048 or 24576 decimal) for future use with low lying languages or other non-relocatable programs.

Ordering Information

See your dealer or order directly from subLOGIC. The package price with cassette is $45. Add $10 for disk option. Both media are usable with the Apple Plus.

If you have a computer system other than an Apple II, write or call for our complete catalog of graphic software and hardware.

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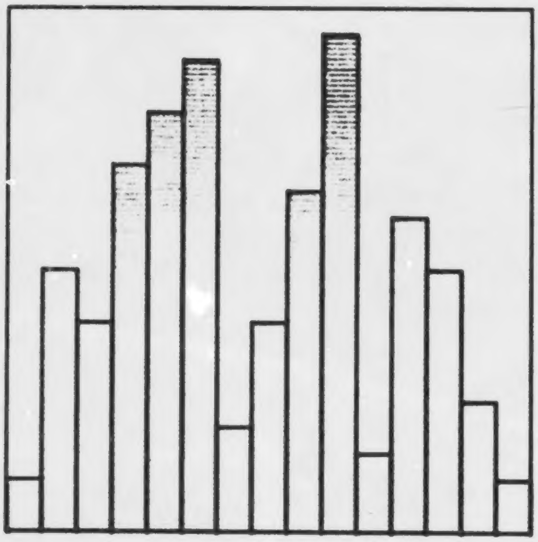

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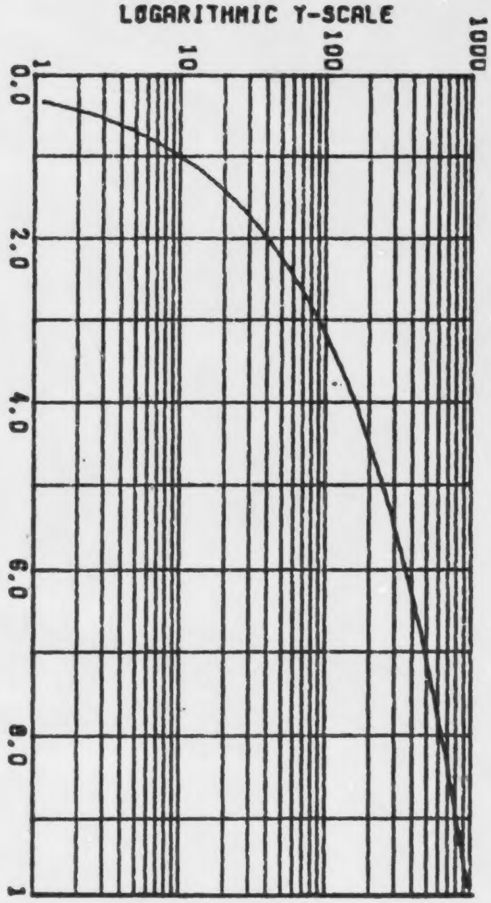

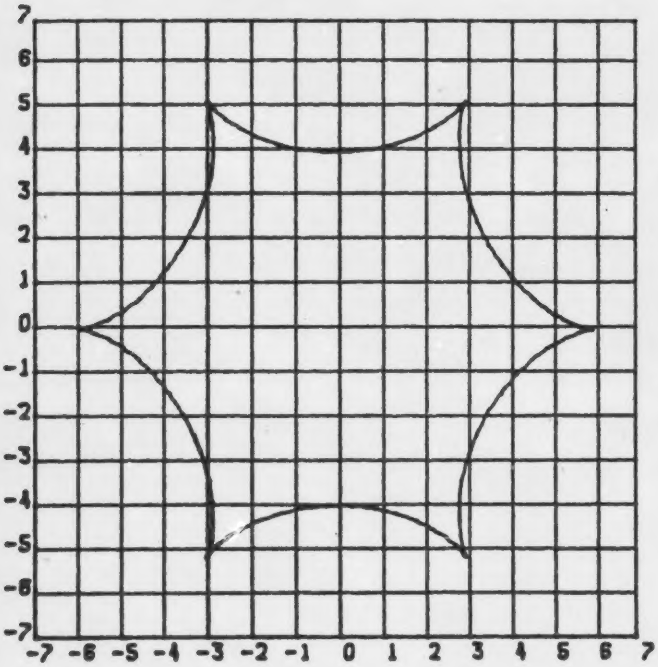

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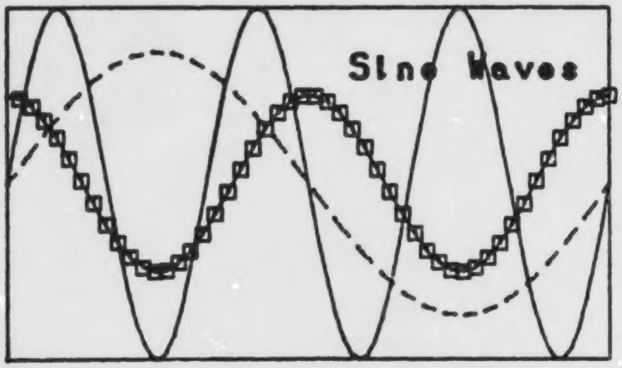

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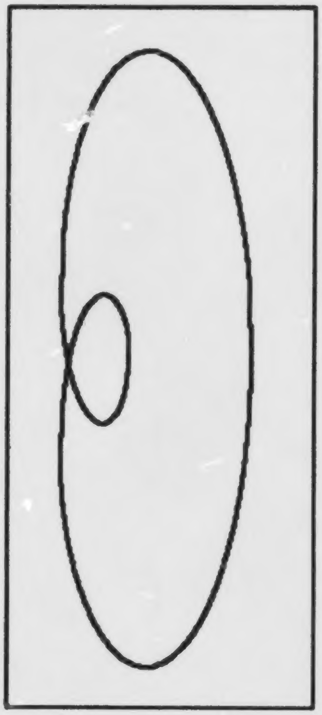

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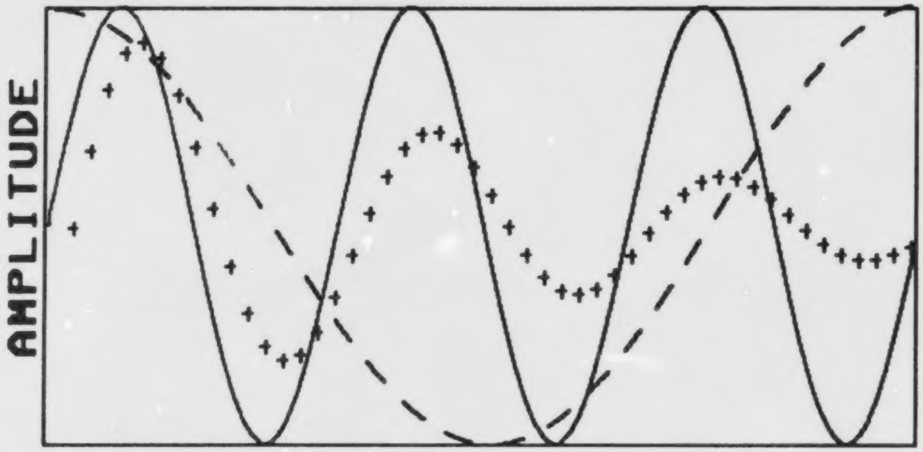

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#AI116 Apple II (16K) #AS116 Applesoft (16K) #T116 TRS-80 LII (16K

All programs with #AI prefix are for Integer Basic on Apple II.

All programs with #AS prefix are for ROM (or Autostart) Applesoft. With the exception of #AS111, the programs will also run with the cassette Applesoft but require more memory than specified.

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The series runs exclusively on the Apple II (48K) computer and will be available in its entirety by the end of 1981. Individual modules will be released periodically, starting on July 15, 1981.

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Late bulletin from Program Design Inc.

May 15, 1981

ANNOUNCEMENT

The new STEP BY STEP for APPLE (disk version)

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DISK TITLE:	SUBLIMINAL
PROGRAM TITLE:	SUBLIMINAL
SUBJECT AREA:	COMMERCE
GRADE LEVEL:	7 AND UP
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
DISTRIBUTOR:	EDU-WARE
APPROXIMATE PRICE:	$15.95 U.S.

DESCRIPTION: Subliminal introduces the user to some of the concepts used in the field of subliminal advertising. Random geometric patterns are displayed upon the screen and, at the same time, words are flashed upon the screen at very high speeds. The user simply presses the space bar when he sees a pattern that appeals to him. After several minutes of this, the user may examine subliminally flashed words. The user may, if desired create his own list of words which will be subliminally flashed upon the screen.

COMMENTS: In an educational setting this program could perhaps be used in conjunction with a series of lessons outlining the history of subliminal advertising in society.

DISK TITLE: TYPEMASTER

PROGRAM TITLE: TYPEMASTER

TYPE: DRILL AND PRACTICE

SUBJCT AREA: INTRODUCTORY TYPING

GRADE LEVEL: 9-12

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: PRINTER, UPPER/LOWER CASE HARDWARE OPTIONAL

MEMORY REQUIREMENT: 48K

D.O.S.: 3.0

DISTRIBUTOR: M.D. FULLER & ASSOC.

APPROXIMATE PRICE: $60.00 U.S.

PURPOSE: Provides practice and evaluation of student performance on typing drills.

DESCRIPTION: This program provides students with a typing drill having a number of features: 1)the drills can be designed and entered by the teacher; 2)student performance is evaluated at the end of each drill with determination of typing speed in words per minute, and the number of errors; 3)allows the student to proceed to a new drill when a pre-arranged standard has been met; 4)generates special drills to provide the student with additional practice on words mistyped or omitted; 5)generates graphical displays of student performance on the screen or from a printer.

COMMENTS: The program should prove appealing to most typing students. Reinforcement is positive and dignified. The program appears to be most useful for periodic evaluation of student progress.

Reviewed by Bruce Green, March/81.

DISK TITLE:	The Apple Grade Book
PROGRAM TITLE:	The Apple Grade Book
TYPE:	Teacher aid.
SUBJECT AREA:	Applicable to all subject areas.
GRADE LEVEL:	all grade levels
PERIPHERAL:	can be used with or without a printer
MEMORY REQUIREMENT:	requires 32K with Applesoft card, 48K without
DISTRIBUTOR:	J & S Software 140 Reid Avenue Port Washington, N.Y. 11050
APPROXIMATE PRICE:	$30 U.S.
DOCUMENTATION:	no

DESCRIPTION: The Apple Grade Book provides the classroom teacher with a program to keep records on student activities.

On the diskette there are two Grade Book programs. The Apple Grade Book requires 32K with the Applesoft ROM card or 48K without the ROM card. The program, Apple Grade Book Printer, requires 48K with or without the ROM card. This program is designed for users having access to a hard copy printer.

Both Grade Book programs are designed to handle classes of up to 44 students taking a maximum of 15 tests, quizzes, or reports. Those with 48K can increase the above variables so that the program can handle any number of classes. By deleting a line in the program, it can be modified to allow more than one teacher to use the diskette.

The first time the program is run, the teacher is asked, "How many classes do you teach?" The teacher inputs the number and then is asked to name each of these classes. Each class must be assigned a different name and this information is stored in a file for future use.

The teacher is next given the main menu and is told that the first task is to input the class roster. After pressing Choice 5 from the main menu, the teacher inputs the names of the students in each class. At the end of the list, the teacher is shown all the students' names and is allowed to make any corrections.

The teacher can then choose option 1 from the main menu. This choice, ADDING GRADES, is used to add the grades for each activity. At the time of adding grades, the teacher is asked for a description of the activity, the point value, the students absent, and the grade for each student.

If at any point the teacher wishes to make changes, options 6, MAKE CORRECTIONS, can be chosen. This option enables the teacher to add new students, delete students, or change a grade.

Three choices in the main menu enable the teacher to analyze class results. Choice 2, LIST A STUDENT'S GRADES, gives the teacher a particular student's grades on all activities. If the student missed an activity, NO GRADE is listed next to that activity. The student's average is also given. Choice 3, LIST CLASS AVERAGES (&SORT) gives a listing of the present class average of each student in a particular class. A star appears next to the names of students who are missing a grade. The teacher can then sort the students by name or grade. Choice 4 on the main menu, LIST RESULTS OF AN ACTIVITY, enables the teacher to see all the student grades for a particular activity.

By using Choice 8 on the main menu, the teacher can delete all student grades and names, or delete only the grades and keep the students' names.

Choice 7 on the main menu is for copying all the data for each class onto another diskette for safe keeping.

The program, Grade Book-Printer permits the user to obtain hard copy results using a printer of items number 2,3 and 4 on the main menu. This includes student results, class results and the results of an activity.

COMMENTS: This inexpensive program will provide teachers with a very easy to use electronic grade book.

DISK TITLE: ELEMENTARY LANGUAGE ARTS, VOL.2, VER.2.3

PROGRAM TITLE: TALK

TYPE: TEACHER AIDE

SUBJECT AREA: COMPUTER LITERACY

GRADE LEVEL: 2-5 READING LEVEL: 2.5

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: Talk is a simple program to familiarize the student with the microcomputer. In the program, the student meets CHUCKO the COMPUTER. Chucko asks him questions about himself and then tells him everything he knows about him before he leaves.

COMMENTS: This is a very nice, friendly, interactive program to use to introduce students to the computer keyboard. Documentation is available. In the revised version high resolution graphics is used to generate text and to draw Chucko the Computer and an Apple.

DISK TITLE:	DRIVER'S EDUCATION/INDUSTRIAL ARTS
PROGRAM TITLE:	DRIVER 1/DRIVER 2
TYPE:	QUIZ GENERATOR
SUBJECT AREA:	DRIVERS' EDUCATION
GRADE LEVEL:	
LANGUAGE:	APPLESOFT
PERIPHERAL:	NONE
MEMORY REQUIREMENT:	32K
D.O.S.:	3.2
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 DISK U.S.

DESCRIPTION: Each program will ask the user true/false questions selected from a file of 45 such questions. Upon completion of the question period, the user is given a percentage score. Some questions employ high resolution graphics as an illustrative aid. Documentation available.

COMMENTS: The program can only be considered marginally useful to Canadians since so many of the questions have a distinctly American content.

DISK TITLE:	DRIVER'S EDUCATION/INDUSTRIAL ARTS
PROGRAM TITLE:	MICROMETER
TYPE:	SIMULATION/TUTORIAL
SUBJECT AREA:	INDUSTRIAL ARTS
GRADE LEVEL:	JUNIOR/SECONDARY HIGH SCHOOL
LANGUAGE:	APPLESOFT
PERIPHERAL:	NONE
MEMORY REQUIREMENT:	32K
D.O.S.:	3.2
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 DISK U.S.

DESCRIPTION: This program teaches the user how to use a micrometer to measure the size of objects as small as .001 inches. The user is presented with a high resolution display of a large micrometer. Animation sequences show the micrometer being adjusted to measure the width of various objects. Documentation available.

COMMENTS: Very attractive and useful program.

DISK TITLE:	DRIVER'S EDUCATION/INDUSTRIAL ARTS
PROGRAM TITLE:	RAFTER
TYPE:	UTILITY
SUBJECT AREA:	INDUSTRIAL ARTS
GRADE LEVEL:	SENIOR HIGH
LANGUAGE:	APPLESOFT
PERIPHERAL:	NONE
MEMORY REQUIREMENT:	32K
D.O.S.:	3.2
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 DISK U.S.

DESCRIPTION: In this program, the user provides the total width of a building (in feet), the pitch of the roof, and the distance the eave will project beyond the wall. The program then calculates and displays various information about rafter and w-truss dimensions. Documentation available.

COMMENTS: The utility of this program is limited by the fact that imperial rather than metric dimensions are used throughout.

DISK TITLE: DRIVER'S EDUCATION/INDUSTRIAL ARTS

PROGRAM TITLE: STAIRS

TYPE: UTILITY

SUBJECT AREA: INDUSTRIAL ARTS

GRADE LEVEL: SENIOR HIGH

LANGUAGE: APPLESOFT

PERIPHERAL: NONE

MEMORY REQUIREMENT: 32K

D.O.S.: 3.2

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 DISK U.S.

DESCRIPTION: This program provides the user with selected information needed to build stairs. All the user need provide is the desired rise and run of the stairs, and the computer will print out the modified rise and run of each stair, the recommended number of stairs, the length of the stringer, and the angle of the stairwell. Documentation available.

COMMENTS: Unfortunately, imperial rather than metric measurements are used throughout. Otherwise, a useful program.

DISK TITLE:	ELEMENTARY LANGUAGE ARTS, VOL.2,VER.2.3
PROGRAM TITLE:	AMAZING
TYPE:	TEACHER AID
SUBJECT AREA:	CLASSROOM ACTIVITY; LOGIC
GRADE LEVEL:	1-6
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	A PRINTER IS NEEDED FOR THIS PROGRAM
MEMORY REQUIREMENT:	32K
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30 U.S./DISK

DESCRIPTION: This program requires a printer. It will print out a different maze every time it is run and guarantees only one path through. The teacher or student can choose the dimensions of the maze. A 32 x 25 maze is the maximum and a 3 x 3 is the minimum. The student then must solve the maze. The revised version displays the maze on the monitor screen as well as providing a hard copy. Unfortunately, after a number of attempts, only a 5 x 5, a 5 x 6, and a 6 x 6 maze were able to be generated with this program. This diskette of programs is accompanied by excellent documentation.

COMMENTS: A spirit master can be made from the original and copies distributed to students for a recreational classroom activity at the end of the class session or to encourage logical, careful thinking.

DISK TITLE: ELEMENTARY LANGUAGE ARTS, VOL.2,VER.2.3

PROGRAM TITLE: CROSSWORD CREATE

TYPE: TEACHER AID

SUBJECT AREA: ALL SUBJECT AREAS

GRADE LEVEL: 1-6

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30 U.S./DISK

DESCRIPTION: CROSSWORD CREATE enables the teacher to create a list of words and short definitions to be used in the programs, WORDGAME and CROSSWORD. If a list has already been created, the program will allow the user to make corrections or additions to the list or delete an unwanted list.

The options allow the user to 1)create a list; 2)edit a list; and 3)delete a list. The user may have up to 100 words on the list. Each word can have up to 15 letters; each definition can have two lines with 20 letters per line. A password system is used which protects the list from non-intended users.

The edit a list option allows the user to add entries, delete entries, change entries or get a list of entries.

COMMENTS: This program is very easy to use and very useful in that it enables word lists to be created and stored on the diskette so that they can be used at a later date.

DISK TITLE:	ELEMENTARY LANGUAGE ARTS, VOL.2.VER.2.3
PROGRAM TITLE:	CROSSWORD
TYPE:	TEACHER AID
SUBJECT AREA:	WORD STUDY ACTIVITY
GRADE LEVEL:	1-6
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	PRINTER
MEMORY REQUIREMENT:	32K
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 U.S./DISK

DESCRIPTION: This program will generate a crossword puzzle. The user can have up to 60 words on one puzzle; each word can have up to 15 letters; each clue can have 2 lines, 20 letters per line.

The user is asked if the word list is already on the diskette. If the teacher answers, "no", he must enter his words and the clues to accompany them. A crossword puzzle is then generated which is displayed on the screen and which can be printed out. Teachers can use diskette stored words created with the CROSSWORD CREATE program on the same diskette.

COMMENTS: The crossword puzzle that appears on the screen is difficult to read. However, as suggested in the documentation, the computer printout can be used as a layout for the puzzle and can be transferred to graph paper. In any subject in which students are required to learn words and their definitions, this would be a useful and enjoyable program.

DISK TITLE: ELEMENTARY LANGUAGE ARTS, VOL.2, VER.2.3

PROGRAM TITLE: WORD FIND

TYPE: TEACHER AID

SUBJECT AREA: ANY SUBJECT AREA

GRADE LEVEL: 1-6

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: THIS PROGRAM NEEDS A PRINTER

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: This program will create word puzzles out of words the teacher has entered using the SPELL CREATE or MIXUP CREATE programs on the same diskette. The teacher has the option of having the words placed in the following ways: horizontally; horizontally and vertically; horizontally, vertically and diagonally; horizontally, vertically, diagonally and in inverted order. The teacher is asked to type in a heading for the puzzle. He then is asked if he would like the words printed in a list at the end. Finally he indicates what size he would like the puzzle to be. An answer key will be printed.

COMMENTS: This program would be very useful in developing word puzzles in many subject areas and for different grade levels. When working with younger children, the first and second options would be suitable. The older children would enjoy a more complex puzzle. Excellent documentation is available.

DISK TITLE: ELEMENTARY LANGUAGE ARTS, VOL.2, VER.2.3

PROGRAM TITLE: WORD GAME

TYPE: EDUCATIONAL GAME

SUBJECT AREA: ANY SUBJECT AREA

GRADE LEVEL: 2-6 READING LEVEL: 2

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: The computer picks a word and its definition from a file created using the WORDGAME CREATE or CROSSWORD CREATE programs on the same diskette and replaces its letters with dashes. The student then guesses the word one letter at a time. If the letter the student guesses is in the word, the computer will replace it. It it is not in the word, the computer will keep track of the letters the student has left. If the student knows the word, he simply types it in without guessing each letter.

COMMENTS: Because a number of word files can be created, this program could be used with a number of subject areas in which students must learn the definition of words. Excellent documentation.

DISK TITLE: ELEMENTARY LANGUAGE ARTS,
VOL.2,VER.2.3

PROGRAM TITLE: MIX UP

TYPE: EDUCATIONAL GAME

SUBJECT AREA: ANY SUBJECT LOGIC, SPELLING
READING LEVEL: 2

GRADE LEVEL: 2-6

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30 U.S./DISK

DESCRIPTION: In this program, a word is picked by the computer, its letters are scrambled, and the scrambled version is printed. The student is to try to guess the original word. The computer gives clues after the student's guess by saying at what positions he has made an error. Before playing the game, the teacher or student must create a list of words from which the computer can choose. This is easily done by using the MIXUP CREATE program on the same diskette.

COMMENTS: Once a file has been created, it is stored under a file name. The file can be changed by choosing to edit rather than create a file. Words can be stored under a number of file names. For instance, French words could be stored under French, Science words under Science, etc. It would be a useful program to familiarize students with new terms and spellings and to review old ones.

DISK TITLE:	ELEMENTARY LANGUAGE ARTS, VOL.2,VER.2.3
PROGRAM TITLE:	MIXUP CREATE
TYPE:	TEACHER AID
SUBJECT AREA:	ALL SUBJECT AREAS
GRADE LEVEL:	2-6, READING LEVEL: 2
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
DISTRIBUTOR:	MECC
D.O.S.:	3.2
APPROXIMATE PRICE:	$30.00 U.S. DISK

DESCRIPTION: Mixup create enables the user to create or edit a word list for the programs mixup, spell, and word find. When it is to be used for the spell program, the user must input the number of seconds the student is allowed to look at the word. After the word list has been entered, it is displayed for the user to check. The user can then create a new word list, edit an existing list or delete an existing list.

COMMENTS: This program is very easy to use. It saves time by allowing the user to store word lists for later use on a diskette.

DISK TITLE:	PRESCHOOL IQ BUILDER
PROGRAM TITLE:	PRESCHOOL IQ BUILDER
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	LANGUAGE ARTS
GRADE LEVEL:	3-6 YEAR OLDS
LANGUAGE:	INTEGER BASIC
PERIPHERAL:	A COLOUR MONITOR OR T.V. IS REQUIRED
MEMORY REQUIREMENT:	32K
D.O.S.:	3.2
DISTRIBUTOR:	PROGRAM DESIGN
APPROXIMATE PRICE:	$23.95 U.S.

DESCRIPTION: According to the developers, the purpose of this package is to help 3-6 year olds develop certain skills that will be used when they start school. Suggestions as to when to begin a child on the program and how to schedule his practice sessions are included in the documentation as is the rationale for each of the programs.

The SAME AND DIFFERENT program teaches the child to recognize the differences between letters. The child looks at a pair of letter-like patterns or actual letters on the T.V. monitor. If the two forms are the same, the child pushes the S key; if they are different, he pushes the D key. As the child progresses through six levels, the pictures and letters become more and more similar and more difficult to tell apart.

The documentation suggests that the parent or teacher cover all keys but the D and S with a cardboard mask and that these be covered with a smiling and a frowning face. It is also suggested that the parent or teacher ensure that the child understands what is expected of him before he is allowed to work independently.

The second program, LETTER BUILDER gives the child practice in matching a letter on the screen with a letter on the keyboard. The student begins with a few letters and progresses through the full alphabet. Again it is recommended that a mask be used to expose only the letters the student is currently working on.

In both programs on the diskette, a correct answer results in a musical series of notes; an incorrect with a beep. The teacher or parent can ask for a child's score by typing a 0 in the SAME AND DIFFERENT program and a ! in the LETTER BUILDER.

COMMENTS: In both programs on this diskette letters of regular Apple II text are used and very young children have difficulty in detecting small differences in letters such as in "m" and "n". The disk has to be rebooted each time to return to the menu.

DISK TITLE:	MY ABC'S
PROGRAM TITLE:	MY ABC'S
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	LANGUAGE ARTS
GRADE LEVEL:	3-6 YEARS OLD
LANGUAGE:	INTEGER BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	48K
D.O.S.:	3.2
DISTRIBUTOR:	SOFTAGON
APPROXIMATE PRICE:	$19.95 U.S. DISK $14.95 TAPE

DESCRIPTION: As described by the developers MY ABC's "is a program designed to develop early learning skill in identification of capital and small letters, and association of letters with pictures". It is intended for the "three-to-six year old child with little or no previous knowledge of the alphabet" and for the advanced child whose reading and spelling development will benefit from "the repetitive nature of the word-and-picture association".

The documentation also suggests that the parent or teacher spend time ensuring that the child can learn how to run the program independently. All the child need do once the program is loaded is press any key or the space bar when the flashing letter shape in the lower portion of the screen matches the letter shape in the upper portion of the screen. Children must also be instructed to say the name of each picture so that they hear the sound as well as see the letter.

The student or teacher chooses whether to work with upper or lower case letters. A second menu enables the user to choose a random selection of letters or he can choose a specific letter from which the program is to begin. The program will then continue through the rest of the alphabet.

Once the starting letter has been chosen and the program begins, a letter shape appears in the upper portion of the screen and three letter shapes appear in the lower portion. Each of these three lower shapes blink one at a time from left to right. When the blinking letter shape in the lower portion of the screen matches the stationary letter shape in the upper portion, the child depresses any key or the space bar on the computer. A correct response causes the three lower shapes to disappear and be replaced by three letter shapes identical to the stationary one in the upper portion of the screen - each appearing in rapid succession and accompanied by audible sounds. Afterwards, the letter shapes in the lower portion of the screen are replaced with picture shapes which begin with the stationary letter. According to the developers, the child should acknowledge the association between the letter shape and the picture sapes by saying the letter and the names of the pictures and hearing the word. The picture name then appears beneath the pictures so the child can see a relationship between the letter shape that has just been identified and the picture shapes which begin with that letter.

If an incorrect response is made, a sad face appears on the screen in place of the incorrect letter shape chosen, accompanied by an audible buzzer sound and an incorrect attempt is scored. The sad face is then replaced with the incorrect letter shape previously chosen and the child is given a second chance with the same letter shapes. If the child gives an incorrect response a second time, the sad face again appears on the screen in place of the incorrectly chosen letter shape, accompaned by an audible buzzer sound and another incorrect attempt is scored. However on the next screen display, while the letter shape in the upper portion of the screen remains the same, the letter shapes in the lower portion of the screen are replaced by three new letter shapes from which to choose. The computer continues this procedure until the child responds correctly before moving on to the next letter shape. If the child fails to make any choice after all three lower letter shapes have flashed in succession three times, an audible buzzer is sounded and an incorrect attempt is scored.

Following completion of the alphabet, a graphic display appears on the screen. At this point, the child advises the adult that the alphabet has been completed and his score may be determined by depressing the control and S keys. The program will list the number of times the child has tried, the number correct, and the number of errors (incorrect on the first attempt). Pressing any key will cause the program to resume at the place where it was interrupted. Control T will return the program to the Starting Point Menu.

COMMENTS: It is recommended by the developers that children use this program independently and it is also recommended that children say the letter and the names of the pictures. As the program is intended for 3-6 year olds with little or no previous experience with the alphabet, it is unlikely that such children would be able to work independently with this program, particularly as some of the graphic representations would be difficult for 3-6 year olds and as they would be unable to read the words beneath the pictures. For example, words and pictures such as heel, unicorn, x-ray and xylophone are used. It is unrealistic to think that these terms would be meaningful to a 3-6 year old.

However, the letters and the pictures are very skillfully graphically represented and the program is fun, well designed, and very easy for little children to use as they can hit any key to indicate a correct answer.

DISK TITLE:	VOWEL EXERCISE
PROGRAM TITLE:	VOWEL EXERCISE
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	LANGUAGE ARTS
GRADE LEVEL:	ELEMENTARY
LANGUAGE:	INTEGER BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	16K
D.O.S.:	3.2
DISTRIBUTOR:	EDUTEK
APPROXIMATE PRICE:	$15.00 U.S. with a media charge of $4.50 per disk.

DESCRIPTION: "A Vowel Exercise" is advertised by the developers as a "teachers' tool" designed for use in teacher/class or tutor/student settings. The program acts as a random syllable presenter and secretly keeps track of how well the student is doing.

A syllable appears on the screen and the teacher tells the student how the syllable is to be pronounced - short or long vowel sound. After the student has tried to pronounce the syllable the teacher types a code to the program which means one of the following four commands: 1)correct student response -- continue; 2)incorrect student response -- continue; 3)correct student response -- wait for teacher comment; 4)incorrect student response -- wait for teacher comment.

Teacher comments may be: 1)any text that the teacher wishes the program to display for the student; 2)the word 'score' to display the current percent correct; 3)the word 'stop' to end the program and give the teacher an opportunity to see a screen or printed report of the activity.

COMMENTS: Not recommended.

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SERIES TITLES:	SPELLING
PROGRAM TITLES:	SPELLING DRILL I SPELLING DRILL II
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	SPELLING
GRADE LEVEL:	GRADE 2
LANGUAGE:	APPLESOFT
SYSTEM REQUIRED:	APPLE II DISK DRIVE
PERIPHERALS:	CASSETTE RECORDER TAPE ACTIVATOR
DISTRIBUTOR:	MENTOR SOFTWARE INC. P.O. BOX 791 ANOKA, MN. 55303
PRICE:	$54.95 FOR EACH PACKAGE OF 6 PROGRAMS
REVIEWED BY:	ROBERT J.D. JONES SIMON FRASER UNIVERSITY

The Mentor Spelling programs provide spelling drills to students using an audio tape synchronized to a computer generated lesson. The cassette recorder, connected through a tape activator to the game paddle input of the Apple, provides aural stimuli in the form of dictated spelling drills (e.g. "House, The boy went into the house. Spell: house.") while the video screen displays the sentence with the criterion item missing (e.g. "The boy went into the......"). The student types in the missing word which the computer program compares to the expected response.

There are two packages of material available: Spelling I and Spelling II. Each contains six spelling drills with ten to twelve sentences per drill. The producers claim that the items were selected from the grade two curriculum with an emphasis on common words, commonly misspelled words and irregular spellings.

The items are presented in upper and lower case letters generated in the Apple's high resolution mode. The audio tapes are generally clear. Synchronizing the audio tapes to the computer program is simplified by clear instructions to the students guiding them through the process of rewinding and starting the tape at a pre-determined starting point.

Students are allowed two unsuccessful attempts at each item after which the correct spelling is displayed. The percentage of correct items and a list of words missed is presented to the student at the end of the drill. Two worksheets are provided with each drill. The first lists the words used in the drill and could be used by the student for study and review. The second has space for recording the items missed in the drill as well as a review puzzle.

These programs are supported by very readable and complete instructions for the teacher. The cassettes, computer disc, worksheets and documentation come packaged in an attractive and functional loose-leaf binder.

Although these programs operated in an acceptable manner within the limitations set by the producers, this reviewer does not recommend the purchase or use of these materials because of their limited utility. Users are restricted to the spelling drills provided. They cannot modify or create their own drills. The spelling lists provided may not suit a particular curriculum and the pronunciation on some tapes might not suit local accents. The Mentor software resembles the Texas Instruments Speak and Spell with better quality sound but fewer user modes and an even more restricted vocabulary. Teachers interested in using audio enhanced drill and practice routines should consider the Hartley Software (reviewed elsewhere in this series) as a much more flexible and powerful set of programs. The Hartley programs can do all that the Mentor programs do and more.

The rest of this review will examine specific weaknesses in these materials. There is no record keeping function built in which can report the number and type of errors to the teacher. The students are given this information at the end of the lesson but it is not stored in any permanent form for the teacher's later analysis.

As with most drill and practice routines boredom can very easily set in if the pacing is slow and the stimuli is unchanging. There is only one stimulus display sequence used throughout these lessons and its pace is fixed. First a sentence with a missing word is displayed on the screen. This is followed by the aural stimuli provided by the tape recorder. The student has to wait for the audio to end before typing in the response. This is never more than ten seconds but feels much longer if one is ready with the response in the first two seconds as would often be the case with simple items (e.g. The word "go" in "Go and fetch my ball"). These programs should hve been designed with greater learner control of the pacing of items. In a similar vein, there is no easy manner for the student or teacher to escape from a program once started if a decision is made to terminate a drill before it is completed.

Students are given a second try on wrong responses. Because of the one-way, sequential manner in which the audio information is accessed it is impossible to repeat the aural stimuli on the second attempt. Furthermore, the typed error is wiped from the screen for the second attempt thus preventing its being used as a cue in error analysis by the student. The student must rely, then, on short term aural memory and on the contextual clues in the sentence displayed on the screen. This could prove frustrating in some situations or with certain types of learners.

Although the two program disks appear to have six different drills each, these programs are identical except for the different vocabulary terms. It would have been much more efficient to produce one program which simply called up different text files for the particular lesson content. Of course this lack of padding would not look as impressive in a catalogue listing.

The programs tested for this review had a few small but irritating bugs which indicate that they had not been thoroughly tested before marketing. For example, Spelling drill I-5 could not be called from the menu program because a programming error called up drill I-4 in its place.

The audio tapes were also subject to minor but irritating weaknesses. Most of the drills were narrated by a clear female voice with a standard North American accent. Some tapes however, were poor recordings with background noise and "hiss". Some of the tapes used a male voice with non-standard pronunciation (e.g. "git" and "gitting" for "get" and "getting").

CONCLUSION: Because these programs are designed to be used by one student at a time and because the drills are pre-recorded and not modifiable, a teacher wishing to drill a whole class on standard spelling words would probably find it more efficient and easier to use traditional in-class spelling drills with peer correction rather than these programs. If individualized instruction and drilling is desired then a program which allows teachers to create and modify their own drills and keep a record of the students' performance is needed. The Mentor programs do not allow these functions and are, therefore, of limited utility.

SERIES TITLE:	HARTLEY ELEMENTARY EDUCATIONAL SOFTWARE
PROGRAM TITLES:	SKILLDRILL #1 & LESSONS SKILLDRILL #2 & LESSONS SPELLING TEST #3 VOCAB DRILL #4 & LESSONS SKILLDRILL #5 & LESSONS SKILLDRILL #6 & LESSONS SKILLDRILL #7 & LESSONS LETTER RECOGNITION #8 WORD FAMILIES #9 CLOCK #10 SKILLDRILL #11 & LESSONS
TYPE:	DRILL AND PRACTICE TESTING
SUBJECT AREA:	LANGUAGE ARTS EASILY MODIFIED FOR ANY SUBJECT
GRADE LEVEL:	ELEMENTARY - BASIC AND REMEDIAL EASILY MODIFIED FOR ANY SUBJECT
LANGUAGE:	APPLESOFT
SYSTEM REQUIRED:	APPLE II, 48K APPLESOFT IN ROM DISK DRIVE
PERIPHERAL:	AUDIO CASSETTE AND INTERFACE NEEDED WITH SOME PROGRAMS
DISTRIBUTION:	HARTLEY SOFTWARE 3268 COACH LANE #2A KENTWOOD, MICHIGAN 49508
APPROXIMATE PRICE:	$15.00-$30.00 WITHOUT LESSONS $20.00-$135 WITH LESSONS
REVIEWED BY:	ROBERT J.D. JONES SIMON FRASER UNIVERSITY

OVERVIEW: The Hartley educational software consists of a variety of drill and practice lessons and testing programs. Each diskette comes with dozens of short classroom tested lessons developed by an experienced teacher and a computer programmer.

The programs are well written, visually attractive and very user oriented. Teachers may either use the prepared lessons or construct their own lessons using the lesson construction programs. The programs come with complete documentation describing the lesson contents and modes of utilization. They may be purchased in their skeletal form (without any subject matter content) from $14.95. Or they may be purchased with dozens of optional language arts lessons at a variety of prices ranging from $20.00 to $135.00.

Several of the Hartley programs are designed to be used with a cassette recorder which presents audio stimuli synchronized to the computer's video stimuli. An optional interface called "The Speller Box" is plugged into the game paddle input of the Apple and connected to the "remote" plug of the cassette recorder. Teachers can easily produce their own audio cassettes using the computer program which guides the narrator so as to synchronize the cassette to the program.

This software is recommended because of its well designed drill and practice sequences, its flexibility allowing teachers to create their own lessons or to use prepared lessons, its audio capabilities, its student record keeping and its clear documentation. It can be used "as is" in the elementary language arts program or, in the hands of an enterprising teacher, it could be used at any level in any subject where drill and practice procedures are needed.

DETAILED REVIEW: Each of the disks in this series contains different lessons and utilizes different modes of drill and practice. They all, however, share certain common features. We will examine these first before looking at the individual programs.

All the programs provide drill and practice procedures. A stimulus item in the form of a word or series of words is displayed on the video screen. This is coordinated, in some programs, with audio instructions and aural stimuli coming from the tape recorder. The student responds with a simple typed response which is compared to the expected response by the computer program. Drill and practice procedures are suitable for lower level cognitive obectives where only one response is acceptable. These programs do not provide instruction so much as the opportunity to practice skills already learned in some other setting.

All of these programs provide attractive, large and easy to read letters in upper and lower case, as needed. They are drawn in the Apple's high resolution graphics mode. Some of the programs provide other visual stimuli such as a smiling face for positive reinforcement.

The programs proceed at the learner's pace providing immediate feedback regarding the correctness of the response. Depending on the program, the student may be given the correct response or told to try again if incorrect. The student may terminate the lesson at any point.

All of the programs have a record keeping function which records the student's name, lesson, number of correct responses, number of items attempted, and a list of the incorrect reponses. This data can be displayed on the screen or on a printer for the teacher's examination.

Operating the programs is simple. The programs are loaded and run automatically without the teacher or the student having to use any computer commands. The teacher can access the lesson creation programs and student records by entering a password when the student's name is requested. Any other word, such as the student's name, allows access only to the lessons.

Instructions are given by the computer on the steps required to use the cassette recorder with the lessons. In the lesson creation mode instructions are given prompting the teacher to provide the various forms of visual and aural stimuli as well as the desired responses. The teacher can concentrate on the subject matter and on the students' responses leaving the programming skills to programmers.

These programs resemble Apple's SHELL GAMES in allowing local lesson production but are superior to the latter in three ways. First, they offer a greater variety of question-answer configurations. Second, they have a true audio capability in the cassette interface. And, third, it is much easier to produce lessons with the Hartley Software because the lesson creation programs prompt and guide the teacher through the process and store the lesson as a text file on the disk rather than as data in a program.

There are three programs in the lesson creation mode. CREATE WORD LIST guides the teacher to input the visual stimuli and responses. CORRECT/CHANGE WORD LIST allows modification, addition or deletion of existing lessons. MAKE TAPE guides to recording of the audio cassette ensuring that it remains synchronized with the visual elements in those lessons using the audio capability.

All the above features are shared by most of the disks. What follows is a description of how each disk differs from the others in the series.

1. SKILLDRILL #1 presents a visual stimulus such as a word with missing letters (e.g. "rou..") while the audiotapes provide synchronized instructions (e.g. type the letters missing in the word "rough"). The student's typed response appears in the missing blanks. The optional lessons with this disk include 28 consonant and 53 vowel lessons each containing 20 items grouped according to spelling rules and levels of difficulty.

2. SKILLDRILL #2 presents a stimulus word (e.g. "goose") with accompanying audio instructions (e.g. "what is the plural form of 'goose'). The student's typed response appears below the stimulus word. Available as options are lessons on affixes, homonyms, compound words, plurals, and contractions.

3. SPELLING TEST #3 gives aural test items with no visual display. For example, the tape may say "Spell 'two' as in

'Here are two dogs'". The student would type in the word for the computer to evaluate. No lessons are provided with this disk because the producers felt that teachers would want to define their own spelling lists. While ideal for individual spelling tests this program could be used in a variety of subjects where exact responses to simple audio stimuli are being tested.

4. VOCAB DRILL #4 presents a visual stimulus in the form of single words. The student is asked to sound the word and then to press a key which signals the tape to provide an aural rendition of the word. The student presses a red or a green dotted key to indicate that the word was understood or correctly pronounced. This response is recorded for the teacher's later evaluation. It is important to note that this strategy involves self-assessment rather than the computer's evaluation of the response and that it is only as reliable as the student's ability to evaluate their own responses. Over 2000 words in 63 lists are available as options with this program.

5. SKILLDRILL #5 provides two lines of visual display and aural stimuli which direct the student to select the item (e.g. rhyming word) from one line which best fits an item from another line. There are 18 lessons on rhyming words and on discriminating between "who", "what", "when", "where", "why", and "how" available as options with this disk.

6. SKILLDRILL #6 is identical to #2 but without the audio component. The disk contains 41 basic math lessons as an option.

7. SKILLDRILL #7 is the same as #5 without the audio. The optional lessons are the same as #5.

8. LETTER RECOGNITION presents large, easy to read letters and numerals on the screen. Pupils respond by pressing te key corresponding to the video stimulus. Letters are presented in upper and lower case at the kindergaren level. The first grade version also includes number words (e.g. "sixteen") which the student must enter in their numeral form (e.g. "16"). There is no audio component with these lessons.

9. WORD FAMILIES presents a stimulus word (e.g. "book") along with four letters three of which could be substituted into the word (e.g. "h", "l", "c", "x") to form a new word. The new words are displayed on a miniature television set drawn on the screen.

10. CLOCK is a time teaching program which gives students practice at telling time from a clock. This program is very different from the others in this series both in its content and mode of presentation. A larger clock face is displayed on the screen. In one program the time is given digitally (e.g. "2:45") at the bottom of the screen and the student sets the clock hands by pressing "F" for forward or "B" for backward to move the hands. In a second program the student types in the time in a digital form (e.g. the student types "4:10") in response to the time displayed on the clock face. In a third lesson the computer displays a written time (e.g. "quarter to ten") which the student must set on the clock face by typing "F" or "B". In lesson one and two, the student may select from among five levels of difficulty: hour, half-hour, quarter-hour, five minute and one minute increments. There are no provisions in this program for the teacher to create lessons but there is still the student report program which keeps a record of the students' performances.

11. SKILLDRILL #11 displays four lines of visual stimulus and the student's response on a fifth line. This program dffers from earlier programs in that provisions are made for up to four different responses allowing some flexibility in response construction. Optional lessons with this package include 10 calendar lessons and 9 language usage lessons.

DISK TITLE: ELEMENTARY VOL.5, VER.1.5

PROGRAM TITLE: PREFIXES

TYPE: TUTORIAL/DRILL AND PRACTICE

SUBJECT AREA: LANGUAGE ARTS

GRADE LEVEL: 2-6

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: In this diskette, students are given a lesson on Un, Re, Dis, Pre or In. The lessons involve a tutorial session followed by activities in which students fill in the blanks with the suitable prefix or underline the prefix of the word. There are two reviews, on Re and Un called "Dragon Fire" in which the student builds a dragon by getting the answers correct and one on Dis, Pre and In called Pre-App 11 in which the student builds a robot which verbally tells the student his correct answers space him out and then says good-bye.

COMMENTS: This is an excellent tutorial and drill program for elementary and junior secondary students who need remedial work. Throughout the tutorial, animated figures such as a man doing pre-game drills or a truck loading and unloading keep the student interested. High resolution graphics have been used to make large, readable print. Small amounts of information and few directions are given at one time. Old material is erased before new material appears. The tutorial portions are clear, organized and well presented. The activities provide useful practice for the students. The idea of presenting a score as a completed robot or dragon by using the students correct answers to build the figure is one which children like.

A high quality, useful program with excellent documentation.

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DISK TITLE:	ELEMENTARY LANGUAGE ARTS, VOL.2, VER.2.3
PROGRAM TITLE:	SPELL
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	ANY SUBJECT WHERE SPELLING IS TAUGHT
GRADE LEVEL:	1-6 READING LEVEL: 3
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 U.S./DISK

DESCRIPTION: This program tests the student on his spelling and his visual memory. The teacher or student, using the SPELL CREATE or MIXUP CREATE programs, has to have created a file of words on which to be tested. The computer prints one of the words from the file, gives the student time to look at it, and then asks the student to spell it correctly. The teacher, when creating the file, can decide how long a student will have to look at the word.

COMMENTS: This is a very useful program for providing drill and review in spelling words in any subject area. The different medium would be enjoyable for students and the option of how long the word is to stay on the screen is a useful one. Excellent documentation is available.

DISK TITLE: SENTENCES

PROGRAM TITLE: SENTENCES

TYPE: TUTORIAL/DRILL AND PRACTICE

SUBJECT AREA: LANGUAGE ARTS

GRADE LEVEL: 5TH GRADE AND UP

LANGUAGE: APPLESOFT

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

D.O.S.: 3.2

DISTRIBUTOR: MICROPOWER AND LIGHT CO.
(BELL AND HOWELL IN CANADA)

APPROXIMATE PRICE: $32.00 U.S.

DESCRIPTION: In the one page documentation which accompanies this program the developers state that the program "adreses (sic) the following topics:

1) The subject of a sentence including identification of the 'simple subject'.
2) The sentence predicate highlighting both 'action' and 'being verbs'.
3) The fragmented sentence what it is and what to do about it!"

The developers state that the intended users are 5th grade and up although adults can use it as a refresher course.

All of the Micro Power and Light programs viewed begin with a noisy title page with the title of the program spelled out slowly in low resolution colour graphics. This is followed by a long copyright message and then with directions on procedures for using the program. A flashing cursor at the left of the screen signals the user to press the space bar to continue, a "B" allows the user to review the previous screen, and an "S" allows the student to skip to the end of the lesson. Regardless of how many times the user has used the program, he must sit through the noisy and slow title page, the copyright message and the directions to the user.

The developers are inconsistent in their use of protocol. On one screen the user may use the space bar to continue text on one screen. The next screen may appear with no user control over the pace. The "B" to move back a screen occasionally does not work, and the developers have neglected to mention that the return key must be used after a response.

The program itself uses a tutorial mode to define what is meant by a "sentence ... a group of words that express a complete idea". However, the authors of the program have neglected to include any end punctuation in their sentences and the text mode prevents the use of capital letters to begin a sentence.

In a friendly tone which provides encouraging feedback for correct answers, the program continues with examples to illustrate what is meant by the subject, "the person or the thing the verb is telling about".

Unfortunately, the authors have chosen a poor example to illustrate subject and predicate. In the sentence, "The long blue coat is mine," the student is told that the "long blue coat" is the subject because "is" tells about the long blue coat. And because "coat" is the "key word in the subject" coat is the "simple subject",

In most grammar texts coat would be termed a "bare" subject with "simple" being used when differentiating between a simple and a compound subject or predicate.

The student is then given the option of seeing another example or of playing a baseball game to practice picking out subjects. For the adult using the program as a "refresher", the game is not appropriate. The student chooses to attempt 1)a single, 2)a double or 3)a home run, depending on how difficult a sentence he would like. A minimum of four correct responses will win the game. Sentences are randomly generated. However, on two occasions, the same sentence came up twice in a row. If the student is having difficulty, he can ask for help and receive a review of the lesson.

The program then moves on to a lesson on predicates. A predicate is defined as telling "what the subject is doing or being". The student is then given a sentence and chooses the predicate from three alternatives. He is then told that the key word in the predicate is called the "verb" and he can then choose whether he would like a review of "action" and "being" verbs. He is then told that "these words join the subject to the predicate". Since the verb is part of the predicate this is an inaccurate and confusing statement.

Again the student can review or play a game. Again there is an unfortunate choice of terms and sentences to illustrate the lesson. The student is asked to type the verb which earlier has falsely been called the predicate. Sentences containing helping verbs and infinitives are used in the game and this must be very confusing for the student who is looking for "action" words. For example, in the sentence, "Cindy likes to play with snakes", students could easily identify "play" as the verb and it would be very awkward for the teacher to have to explain that in this case play is not a verb.

The student again is offered the opportunity to review before proceeding to the next segment which deals with sentence fragments. A sentence fragment is incorrectly defined as "a group of words that is missing either a subject or a verb". The student then identifies the sentence fragment from a list of four choices.

The student can review subjects, predicates and sentence fragments or do a practice exercise in combining subjects and predicates to form sentences. The four possible sentence combinations result in nonsense sentences which are followed by graphical illustrations of the sentences. For example the subject "the tree", combined with "rides with her" results in a tree and a woman driving slowly across the screen in a car. Again, one questions how appropriate the program would be for adult refresher courses. Once the student has tried all possible combinations and seen the girl, the pig, and the tree ride in the car and hop across the screen there is nothing left to do.

Micro Power and Light's Sentences program has some good features. The "B" key which allows the student to review the last screen is very useful in any program although it should be pointed out that it can only be used at certain points in the program. The "help" option during a quiz is also valuable as is the opportunity to review a lesson before proceeding, but these review procedures should present the material in a different manner or in more depth than the first presentation. The idea of using a game to motivate students to practice newly acquired skills is good, but the games are poorly designed and do not allow enough practice. Another good feature is the option which enables the user to enter the program beginning with subjects, predicates or sentence fragments.

Generally, however, because of the inaccuracies in the content, the lack of consistencies in user directions with control moving from the learner to timing loops, the poorly designed practice exercises which need more and better examples with scores that are meaningful to the teacher, the unnecessary noise, and the slow pace at the beginning of the program, this program, cannot be recommended.

DISK TITLE:	NOW I CAN RHYME
PROGRAM TITLE:	NOW I CAN RHYME
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	LANGUAGE ARTS
GRADE LEVEL:	PRE-SCHOOL & ELEMENTARY (INFERRED)
LANGUAGE:	INTEGER BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	48K
D.O.S.:	3.2
DISTRIBUTOR:	SOFTAGON
APPROXIMATE PRICE:	$19.95 U.S.

DESCRIPTION: According to the developers, NOW I CAN RHYME "is intended for the child with little experience in rhyming sounds and also for the more advanced child to increase rhyming skill and enjoyment as well as enhance spelling and reading skills". Its purpose is to "develop an ending sound awareness by the identification of picture shapes in which the final sounds are the same (rhyme)".

It is recommended by the developers that after an initial familiarization with the program. the child should work independently and should say the name of each picture as it appears on the screen.

The child can begin at Level I, II, or III. In Level I, a stationary picture shape appears in the upper portion of the screen and two picture shapes appear in the lower portion. Each of the two shapes in the lower portion blink one at a time from left to right. When a blinking shape in the lower portion of the screen rhymes with the stationary shape in the upper portion, the child depresses any key or the space bar on the computer. A correct response causes the picture shape in the upper portion of the screen to disappear. and the two picture shapes in the lower portion are replaced with the two rhyming shapes. Next, the name of each picture shape appears beneath each shape. Then, the "common" part of each word becomes underlined and remains on the screen while the remainder of the words disappear. Finally, the picture shapes exchange positions on the screen and the words below are interchanged, followed by audible tones.

In Level II, three picture shapes appear in a row on the screen. The picture shapes blink in pairs. When a blinking pair of shapes rhyme, the child depresses any key or the space bar on the computer. A correct response causes the incorrect shape to disappear and the rhyming pair appear in the lower portion of the screen followed by the same reinforcement as Level I.

In Level III, four shapes appear on the screen - two in the upper portion of the screen and two in the lower portion. The "common" part of the rhyming word appears beneath the lower shapes. The shapes blink in pairs. When a blinking pair of shapes rhyme, the child depresses any key or the space bar on the computer. A correct response causes the two incorrect shapes to disappear and the rhyming pair appear in the lower portion of the screen followed by the same reinforcement as in Level I.

If an incorrect response is given by the child in any Level, a sad face(s) replaces the incorrectly chosen picture shape(s) accompanied by an audible buzzer sound and an incorrect attempt is scored. Then the same shapes reappear for another try

Each Level continues until it is stopped by a control S to obtain the child's score which lists the number of times the child has tried, the number correct on the first attempt, and the number of errors. Depressing any key will cause the program to resume at the place where it was interrupted. Control T terminates the program and causes a return to the Menu.

COMMENTS: The use of high resolution graphics shapes is effective and the program is well designed in presenting randomly generated drill and practice material in final sounds. In an effort to simplify directions for little children who cannot read or write, timing loops have been used to have pairs of shapes blink simultaneously. The pace of the program is, as a result, predetermined and will certainly be too slow for some students, too fast for others. In addition, some of the pictures will be difficult to identify. For example, very young children would probably have difficulty in recognizing a wing.

DISK TITLE: SPELLING RULES

PROGRAM TITLE: SPELLING RULES

TYPE: TUTORIAL/DRILL AND PRACTICE

SUBJECT AREA: LANGUAGE ARTS

GRADE LEVEL: 5TH GRADE AND UP; ADULT 'REFRESHER COURSE'

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

D.O.S.: 3.2

DISTRIBUTOR: MICRO POWER & LIGHT; BELL & HOWELL IN CANADA

APPROXIMATE PRICE: $32.00 U.S.

DESCRIPTION: According to the developers, the principal intended users of this program include 5th grade students and up and adults who need a 'refresher course'.

The program covers rules related to:

1) ie or ei
2) final e
3) adding k
4) final consonant
5) -sede, -ceed, -cede
6) final y

The student can begin at any rule and take them in any order. With each lesson the rule is given with one or two examples to illustrate it and then the student battles the alien to prevent dab yug from jamming earth's air waves with bad spelling. At the end of each lesson the student can review a rule or go on to the next. At the end of the third rule the student can review either of the three rules again or go on to the next lesson.

COMMENTS: In the analyst's opinion, there are a number of areas where this package needs improvement:

1) the slow generation of text, timing loops, and the unnecessary sound and graphics result in a very slow pace and a very passive and inactive learner;
2) there are not enough examples provided to illustrate rules and not enough questions in the practice exercises;
3) there is no pretest to determine entry level or sequence;
4) material for review is presented exactly the same the second time around;
5) the alien "dab yug" is crudely used and inappropriately childish for the intended users;
6) the noisy title page, long copyright message, and the directions to the user are very irritating.

DISK TITLE: SPELLING BUILDER

PROGRAM TITLE: SPELLING BUILDER

TYPE: TUTORIAL/DRILL AND PRACTICE

SUBJECT AREA: LANGUAGE ARTS

GRADE LEVEL: JUNIOR HIGH AND OLDER

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: TAPE RECORDER NEEDED FOR SPELLING TEST

MEMORY REQUIREMENT: 32K

D.O.S.: 3.2

DISTRIBUTOR: PROGRAM DESIGN

APPROXIMATE PRICE: $26.50 U.S./DISK

DESCRIPTION: SPELLING BUILDER is a series of eight programs that teach important spelling rules and build spelling ability. According to the developers, "This course is not just spelling drill since it teaches a method for approaching difficult words. It is ideal for the student or adult who has mastered basic spelling but has trouble deciding if it is 'supersede' or 'supercede', 'combustable' or 'combustible'.

Seven of the programs teach the rules that apply to "tricky" words, and the eighth program is a spelling test on audio cassette:

Lesson 1: Syllabification
2: Doubling the Final Consonant
3: Final "e" with suffixes
4: Adding suffixes to words ending in "y".
5: Tricky Plurals
6: "ie" or "ei"
7: Troublesome suffixes
8: Spelling Exercises (320-word spelling test)

In all seven programs, the spelling rule is given with effective illustrations and examples. The student then answers questions based on the information he has just read. The program will continue if the student enters the correct response but an incorrect answer will not be accepted. Any exceptions to the basic spelling rule are cited and then the student is presented with all the rules taught in that particular lesson. He then has the option of reviewing the lesson or moving on to the next program. The final program enables the user to take tests using an audio tape which is started and stopped for each word.

COMMENTS: The only justification for putting this material on the microcomputer is the program's ability to assess correct and incorrect responses and in the last lesson to record the words with which the student had difficulty. The programs are straight textual tutorials or drill material with no graphics or branching. There is no pretest to assess entry level and although there is an option to review the lesson, the material is presented again but with no variation in instructional approach or material.

However, for the teacher or student who would like a program to teach the trickiest and most difficult rules and exceptions to rules in spelling, this series of programs is well designed and effectively presented. The content is accurate, the instructional design is effective, and the use of the microcomputer is competent, if dull. The developers suggest that the programs are ideal for the student or adult who has mastered basic spelling but who has difficulty with "tricky" words and this would seem to be the best use for them. Students with learning problems would find the rules and the spelling words very difficult. In the analyst's opinion, only highly motivated students would use the program effectively and willingly.

PACKAGE TITLE:	MicroSystem 80
PROGRAM TITLE:	Critical Reading
TYPE:	tutorial/drill and practice; managed
SUBJECT AREA:	logic, reading
GRADE LEVEL:	middle-grade-adult; grade 3 reading level
PERIPHERAL:	no
SYSTEM REQUIREMENT:	Apple II, 48K with disk input
DISTRIBUTOR:	Borg Warner Educational Systems 2305 West King Edward Avenue Vancouver, B.C. V6L 1T3 ATTN: Wes Edwards 731-3439
APPROXIMATE PRICE:	$850 Canadian (half the set is available)
DOCUMENTATION:	Very good

DESCRIPTION: According to the Teacher's Manual, Borg Warner's Critical Reading Program is designed to"introduce a student to the basic rules of logic and to provide practice in reasoning skills which will aid in his/her overall comprehension of reading material".

The program has been written at a third grade reading level, but it is designed to be used by middle-grade, junior and senior high, and adult students. According to the developers, it may be used on a remedial basis for older students who are reading at a third to sixth grade level, and it is also recommended for thos students preparing for achievement or ability tests that have reading comprehension passages.

The program consists of an eight lesson series. Two lesson series, for example, A and B, constitute a unit of material which has been designed to give the student experience with the use and understanding of a basic rule of logical inference. Within each unit, there are four levels of instruction representing a progressively more difficult context for the use of the rule.

As described in the Teacher's Guide, each lesson series contains a pretest which is used to prescribe the entry lesson for the student; the lesson which is determined by the student's performance on the pretest; a progress check which assesses the student's comprehension of the material presented in the lesson, a post-test which provides a re-evaluation of comprehension and a comparison with pre-test scores; and a management system which is used to maintain a student's records.

The pre-test is administered to determine the student's entry level. The pass criterion is one error on the material for that level; the fail criterion is two errors per level. The student's performance determines the pattern the pre-test will follow but each pre-test follows the same basic format.

The student's lesson assignment is automatically determined by the program on the basis of the pre-test performance. The lesson is presented in an instructional mode. The student is presented with two short sentences or a paragraph depending on the level of difficulty. A statement about the previous information is made and the student is asked to respond with a T(true), F(false), or U(unsure). In the higher levels, the student may be asked to answer with an A, B or C to identify which clue would give the best added information to help answer a specific question about the material.

After each statement the student has up to two chances to respond with the correct answer. Each student response, whether correct or incorrect, is acknowledged with a "beep" and either an "explanation" or a reinforcement message.

As soon as the student has completed the lesson, a lesson review is administered. Any question to which the student did not respond correctly on the first attempt is presented again and them again if the student misses the question on both previous attempts.

At the end of the lesson review, a progress check is presented in the test mode and the student's score is displayed on the screen. The items missed on the progress check are recycled in a progress check review which is presented in the instructional mode which is used in the lessons. The student's cumulative record is revised for his/her benefit but his original score is recorded in the management system.

At the end of the progress check review, the student is automatically assigned a lesson for his/her next time on the program.

At the conclusion of each lesson series, a post-test is administered.

Each lesson series contains its own management system which keeps records on all students working in that lesson series. In levels A-F, eight groups of 18 students each can be entered; in levels G and H, eight groups of seven students. The system allows teachers to display records for any class or individual student, delete all records for a class, change disks or class number, or modify the program so that the jingle is deleted from the program.

The program is divided into major categories and subcategories as outlined below:

Disks A & B

I The Rule for "Or" Elimination
  1. making valid inferences
  2. identifying incompatible statements
  3. recognizing illogical statements

Disks C & D

II The Rule for "All" Elimination
  1. making valid inferences
  2. identifying incompatible statements
  3. recognizing illogical statements

Disks E & F

III Conditional Statements
  1. making valid inferences
  2. identifying incompatible statements
  3. recognizing illogical statements

Disk G

IV Inductive Reasoning
  1. making valid inferences
  2. identifying incompatible statements
  3. recognizing illogical statements
  4. determining a missing premise
  5. drawing a conclusion
  6. identifying valid inferences, incompatible statements and statements that do not follow a logical pattern.

The Teacher's Guide specifies these major categories and subcategories in a chart which provides behavioral objectives and examples of lesson materials for each level of difficulty.

An example of the chart from level IV of Lesson series C and D is given below:

Major Category
Rule for "All" Elimination

Subcategory
Making Valid Inferences

Objective

Given a paragraph in which some of the sentences are not relevant to the "All" situation(s), in which one or more of the qualifiers may not be explicitly stated, and in which pronouns may be used to replace their antecedents, the student will be able to draw a conclusion in order to make a valid inference.

3. Carl looked at the cars in front of his house. Every one was red. Some had whitewall tires. The big car belonged to Mr. Judd. The one on the end belonged to Mr. Trent. A small car was in the middle.

(c) The small car was red.

Answer: T

The Teacher's Manual clearly outlines the broad goals, specific objectives, methodology, and evaluative procedures for the program. It also provides directions on how to set up the computer, offers suggestions as to how the program might be used, and details a lesson plan for orienting students to the program and the use of the computer.

COMMENTS: It must be emphasized that this program has been designed to "introduce a student to the basic rules of logic and to provide students with reasoning skills which will aid in his/her overall comprehension of reading materials". That is, it is assumed that if the program is used, reasoning skills will be developed and this will improve the student's comprehension of reading materials. The focus of the program is on logical thinking, not reading comprehension.

The program does not, in a literal sense, "introduce the student to the basic rules of logic". If the teacher provides the introduction to basic rules of logic, then this program provides the student with practice materials at his/her level of competency. The student can benefit from the program with no pre-teaching, but it is unlikely that rules of logic can be generalized by the student from working through the program. Whether the student's overall reading comprehension will be improved from using this program cannot be determined.

Although the program is intended for middle school to adult students, it has deliberately been developed at a grade three reading level. The elementary vocabulary and exclusive use of simple sentences may irritate teachers and older students, while the concepts, particularly at the higher levels, may be too difficult for younger students. Whether connectives between sentences have been omitted to simplify the reading level or whether the developers felt they would provide too obvious clues to the answers, paragraphs written with no logical sequence are artificial and do not reflect the typical reading material of the student. Connectives such as "since" and "although" must be considered in any study of the logical development of ideas in written material, and it is unfortunate that this program chooses to exclude this topic.

Because the information presented to the student must be left on the screen while questions are asked and comments made, the presentation of the textual materials is very crowded on the screen. There are no lines left to separate paragraphs from questions or questions from explanatory or reinforcement comments. This crowding combined with the unnatural style of the writing and the strain in attempting to separate relevant from irrelevant, important from unimportant details may leave the user feeling frustrated and overworked.

In the higher levels of the program, the student builds on the original paragraph by providing clues which will enable specific questions to be answered. Unfortunately, if a student misses a question at this level, it can be recycled in a progress review check without the additional clues and information that led up to the question.

In summary, Borg Warner's Microsystem 80 Critical Reading series provides practice material in reasoning skills and the basic rules of logic for middle grade to adult students reading at a grade 3-6 level. Teachers will have to decide on the degree of emphasis and importance they place on reasoning skills in a total reading comprehension program in order to determine whether they think the series is worth the $850. For those who feel part of the series would be valuable, Series A-D and E-H can be purchased separately.

DISK TITLE: DK-INTROA

PROGRAM TITLE: INTRODUCTION TO MATHEMATICS ON THE COMPUTER

TYPE: DRILL AND PRACTICE

SUBJECT AREA: MATHEMATICS

GRADE LEVEL: 1.5-4, READING LEVEL 2, SLOW LEARNERS, LD

LANGUAGE:

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

D.O.S.: 3.2

DISTRIBUTOR: EDUCATIONAL ACTIVITIES (VAN NOSTRAND REINHOLD IN CANADA)

APPROXIMATE PRICE: $64.90 U.S. FOR DISK OF 2 PROGRAMS

DESCRIPTION: According to the developers, "This program was designed to help slow learners and learning disabled students increase their mathematical abilities by decreasing the distractibility factor and increasing the student's interest."

The student chooses the operation - addition, subtraction, multiplication, division - and the level of difficulty - 1-6. The problem is presented with four choices across the bottom of the screen. A correct response results in the correct answer being displayed with a reinforcement message for the student. Two consecutive incorrect entries result in the same problem being presented as a word problem. As soon as the student achieves 85% on the first try, he can choose to continue at the next level of difficulty.

COMMENTS: According to field test results in a Learning

Assistance Centre, this was a "dull, disappointingly limited multiple choice program holding lttle appeal ...." The teacher felt:

1) the numerical presentation was too small;
2) the material was too difficult for the 1.5 grade level specified;
3) it took too long to generate new questions;
4) it was difficult to escape from the program;
5) accidentally hitting the RESET key or the RETURN key without entering an answer meant rebooting with the BASICS disk for schools which have the DOS 3.3 systems;
6) students were able to do well simply by guessing even though choices were changed each time the same problem was presented; and
7) at the higher levels, students were unable to perform calculations on the screen but had to use scrap paper and enter their answers from left to right.

Each Mathematics program in the series has been designed to allow the student's scores for each lesson to be stored on a separate diskette. To utilize this feature, the Grade Storage Diskette is necessary.

Field tested by Delmere Kitt, Koksilah Elementary School, Duncan, B.C.

PACKAGE TITLE:	Milliken Math Sequences, Grades 1-8 Revised Edition
TYPE:	Drill and Practice
SUBJECT AREA:	Mathematics
GRADE LEVEL:	Grades 1-8, adult education
PERIPHERAL:	printer can be used
SYSTEM REQUIREMENTS:	12 diskettes for Apple II Plus (48K) 12 casettes for TRS-80 (level II, 16K) 12 casettes for Commodore Pet (8K)
DISTRIBUTOR:	Moyer Vico Corp. 25 Milvan Drive City of North York Weston, Ontario M9L 1Z1
APPROXIMATE PRICE:	Apple - $450 U.S. Apple with extra set of 12 diskettes for back-up - $675 Replacement diskettes - $40 each TRS-80 - $200 U.S. Replacement casettes - $20 each Commodore Pet - $200 Replacement casettes - $20 each
DOCUMENTATION:	yes

DESCRIPTION: Milliken's revised Math Sequences is basically the same package as the original Sequences described in the Courseware Descriptors section of the JEM Reference Manual. However, weak areas of the original Sequences have been completely revised or strengthened and the resulting revised edition is an excellent drill and practice package for students in Grades 1-8.

The package still contains twelve diskettes, a Teacher's Guide, four duplicating masters, and an "Easy-Does-it" card (a step-by-step guide to operating the computer).

The excellent Teacher's Guide follows the same format as in the original edition, but includes a Scope and Sequence Chart which breaks down the problem levels according to specific skill areas. The problem levels are then coordinated with the grade levels where the skills are generally introduced. Using this Chart, the teacher can locate the diskette and problem level which will generate problems of a specific type and at a specific level of difficulty. For example, division problems with two digit divisors with remainders can be found on the division diskette at problem levels 47, 49, and 51. The teacher can then read a description of the problem level and see an example of the type of problem in problem level examples at the back of the Guide.

The original Sequences provided drill and practice in nine mathematical operations. In the revised Sequences, the Negative Numbers Sequence has been replaced with an Integers Sequence and a Number Readiness and Measurement Formulas diskette have been added at each end of the Sequences. The Number Readiness Sequence is perhaps unnecessary as if a student is sufficiently grounded in basic reading skills to be able to read "Press Return to Continue", then number readiness is likely not necessary.

The generation of characters with low resolution graphics which caused such problems with the original Sequences has been replaced by characters generated by high resolution graphics. The numbers and operations signs are large and clear, although, of course, not in colour. Colour is provided in the animated reinforcement message which is superbly done. Approximately a dozen colourful, animated figures appear in the top corner of the screen when a correct response is entered. For older children, the "set options for a class" allows teachers to choose textual reinforcement instead of animated graphics. This also enables the program to be used with adult students, although the occasional "WOW" still slips in.

The text is large and very easy to read. The screen is well organized and the directions to the user are clear and the prompt, so confusing in the original Sequences, appears as a question mark exactly where the user is to input a number. Even in a long division question with two-digit divisors and three-digit quotients, a good test of a program, the user is clearly led, step-by-step, through the problem, entering as many as a dozen numbers. The pace of the Sequences, a problem in the original Sequences, is as fast as the student using the program although there is, of necessity, a long pause while a new problem is generated.

Students are generally given two chances to work a problem correctly, but in problems such as long division which require a large number of inputs, a formula is used that adds one additional chance as every seven correct inputs are completed.

The first time a wrong answer is entered, the incorrect response is noted and students are told to try again. Once the student enters too many incorrect responses, a large red X flashes on the screen to indicate to the student that the entire problem is wrong. The correct answer or procedure for answering the problem is then shown with the student pressing the return key for each step. Some teachers will object to the flashing red X as it is a very negative feedback technique and perhaps should have been available as an option.

The Management System is basically the same as in the first edition but there have been a number of additions that are definite improvements.

The teacher can choose an option which allows the student to enter the Sequence without using the Manager Program. Therefore, students need not be registered on the diskette or given assignments in order to drill at a particular problem level. This is a most useful option, particularly if the Sequences are used in an informal setting such as a Learning Centre.

Originally, teachers had to enter each student's assignment separately and this was a very tiresome and time consuming task. There is now an option which also permits teachers to enter class assignments which will apply to each student in a class or group. Using an option in the Management System, the teacher can also determine the mastery level, the failure level, and the minimum number of problems to be presented at each level or the teacher may use the levels predetermined by the computer.

The developers have also added a feature which will tell the student to see his teacher if he/she fails the first assigned level. The computer will not let the student reenter the Sequence until a new assignment has been given.

It should be noted that the Per Cents Sequences has a programming error which prevents it from running, and the Scope and Sequence Chart has a problem level error in the Division Sequence. Milliken is aware of these problems and is revising the Teacher's Guide accordingly and requests that purchasers return the Per Cents diskette to be corrected.

DISK TITLE: The Math Machine

PROGRAM TITLE: The Math Machine

TYPE: Managed drill and practice

SUBJECT AREA: Mathematics

GRADE LEVEL: K-6

LANGUAGE: Applesoft

PERIPHERAL: 40 Column Printer Optional

MEMORY REQUIREMENT: 32K or 48K Apple II with Applesoft in ROM

D.O.S.: 3.2

DISTRIBUTOR: SouthWest EdPsych Services

APPROXIMATE PRICE: $80.00 U.S.

DESCRIPTION: According to the developers, SouthWest EdPsych Services (SWEPS), The Math Machine is a "carefully sequenced instructional package which covers arithmetic skills typically taught in kindergarten through sixth grade classes."

The package, priced at $79.95 U.S., consists of a main diskette, a back-up copy which can only be activated with a phone call to the developers, and a thirty-five page manual of support documentation. SWEPS promises to provide a new back-up diskette for $10.00 if the damaged main diskette is returned within one year of original purchase of The Math Machine.

Step by step instructions as to how to use the package are included in the excellent teacher's manual which includes sections relating the instructional design of The Math Machine to the "best available scientific evidence in learning psychology, computer-assisted instruction, educational psychology, mathematics, special education, behavioral psychology and child development" and to the nine instructional events identified by Gagne and Briggs (1979) in their "Principles of Instructional Design."

The program is very easy to use. As soon as the disk is booted and the teacher has typed, "BELL" in response to the program's request for a password, a menu of eight options is presented.

The first option, "Add a student," enables the teacher to build a class list of a maximum of forty students, assign each student a secret password, and specify the problem levels and reinforcement pattern for each student.

The teacher can assign problems from the following functions and levels:

1) Pre-math skills - 19 skill levels
2) Addition - 29 levels
3) Subtraction - 23 levels
4) Multiplication - 30 levels
5) Division - 23 levels

A 'rule of thumb' table is provided to assist teachers in assigning levels to students whose history is unknown, and the appendix to the Manual includes the performance objective for each level and each mathematical operation. In addition, as soon as the teacher chooses a skill level for a student, the performance objective for that level is displayed on the T.V. or monitor screen. An example of the performance objective for level one of the pre-math skills function is: "Given a one-digit number, the student will press the corresponding number key." At the top level of the skills series, division, level 23, the performance objective is: "Given a two-digit divisor, a four-digit dividend, and a three-digit quotient with random remainder, the student will press the number keys which correspond to the quotient."

The manual also includes a discussion of the importance of reinforcement and the need for varying schedules of reinforcement to suit the student and the learning situation. Thus, the program offers the teacher the opportunity to specify how many questions the student needs to answer correctly before he is reinforced. A response is counted as incorrect after two unsuccessful attempts at which time the student is given the correct answer. As soon as he has achieved the number of correct answers as specified by his teacher, he is allowed to play one of a choice of six one minute games as a reward.

The second option on the menu, "Change a student," follows the same steps as the Add a student routine and can be used to change information in that student record without having to delete the record and reenter all of the information again.

The third option, "Delete a student," entirely removes the student from the class list, and the fourth option, "Clear all scores," deletes all student scores in readiness for a new session with the same students. Since The Math Machine records are overwritten each time the student uses the program, the developers have included a print option in the program and Student Record Forms in the support documentation to enable teachers to closely monitor the progress of each student.

COMMENTS: SouthWest EdPsych Services has provided teachers with a relatively inexpensive but useful program for providing drill and practice in math skills typically taught in kindergarten through 6th grade classrooms.

The rationale for using the microcomputer and drill and practice format is carefully argued and the performance objectives for each of the 111 discreet skill levels are clearly stated in both the program and the support documentation.

In the analyst's opinion, the content is accurate and is appropriate for the intended users. However, it should be pointed out that in scope, the program only covers pre-math, addition, subtraction, multiplication, and division. There are no practice materials in fractions, decimals, or percents.

Unlike other programs on the market which raise and lower students automatically, The Math Machine depends on the teacher to determine the point at which the student enters the material and the sequence of skills that is to be followed. The teacher cannot specify the number of problems each student is to complete, but the reinforcement schedule, a timer, or the escape key can be used to terminate a session. The learner has no control over the point at which he enters the program nor over the sequence of skills that are practised.

The feedback on student responses is immediate and appropriate. However, there will be teachers who object to the use of a short game to reinforce and motivate students who have answered a teacher specified number of questions correctly. Those teachers can simply type 0 when asked, "Reinforcement after how many correct answers?"

The manual provides easy to follow directions on entering students' names, specifying passwords and assignments, and reviewing and recording students' progress. The support documentation for the program is comprehensive and provides very helpful suggestions as to how the program might be used in a regular and special education setting.

With direction from the teacher before the program is used, students should have little difficulty in running the program. It should be pointed out to students that the program will not run unless the student enters his password; that sometimes as in division questions, the answer must be entered from left to right in others, from right to left; that for difficult questions they must use paper and pencil to solve the problem; and that the game indicates that they have worked well. The directions for the games are included only in the teacher's manual. Although the student can choose from six games, the teacher will likely find that only one or two are challenging to the student.

As is the case in a number of drill and practice programs on the market, the rate at which new problems are generated is frustratingly slow. Perhaps in an attempt to fill in time, the developers have included a colorful kaleidoscope display between problems. However, in the analyst's opinion, this device is irritating and distracting.

Generally, the screen lay out is good and characters are colorful and readable. Sound is used in three beeps that are used to signal a correct response. The program has been thoroughly student proofed.

In The Math Machine, the capabilities of the microcomputer have been utilized in motivating the student through color, immediate personalized feedback, and reinforcement through a computer game. Questions are generated randomly and at a specified level. The management capabilities of the microcomputer have been used to take students to a specified assignment, score their work, and record the results of their performance.

Although The Math Machine is lacking many of the features its much more expensive competitors on the market are advertising, it provides a very useful and well designed program on one diskette with excellent support documentation for a reasonable price.

DISK TITLE: FINGER ABACUS

PROGRAM TITLE: FINGER ABACUS

TYPE: DRILL AND PRACTICE

SUBJECT AREA: MATHEMATICS

GRADE LEVEL: ELEMENTARY

LANGUAGE: INTEGER BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT 16K

D.O.S.: 3.2

DISTRIBUTOR: EDUTEK

APPROXIMATE PRICE: $15.00 U.S. with a media charge of $4.50 per diskette.

DESCRIPTION: Although the developers claim that "Finger Abacus" teaches recognition of the Chisanbop finger positions, it actually only provides drill and practice in calculating numbers represented by the Chisanbop finger positions. Two hands illustrated in low resolution colour graphics appear on the screen with certain fingers indicated by a coloured halo surrounding their tip. The student is told that he begins with 25 points and then is asked to enter the correct number. If he answers correctly, there is much noise and his name is flashed across the screen repeatedly. If the student answers incorrectly, he loses points, a jingle is played and the correct answer is displayed on the screen. As the student gains points, the questions become progressively more difficult.

COMMENTS: No documentation.

DISK TITLE: ELEMENTARY SCHOOL, VOL.1, VER. 3.3

PROGRAM TITLE: HURKLE

TYPE: EDUCATIONAL GAME

SUBJECT AREA: MATHEMATICS

GRADE LEVEL: 2-6 READING LEVEL: 2.2

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: Hurkle, a little man, hides on a horizontal or vertical line, a 10 by 10 grid or a -5 by +5 grid. The student chooses the line or grid. He is allowed five tries to find Hurkle and after each try, Hurkle tells him in which direction to look.

COMMENTS: The student must know his direction, North, South, East or West as clues are given by saying, "Go South West". The North, South, East, West directions are not provided on the line or grid and the teacher would have to spend some time discussing maps and directions with the students. The negative numbers would be a problem for younger children as would the terms vertical, horizontal and grid. However, there are grade three children who could deal with these concepts and for those who couldn't, the choice of finding Hurkle on a vertical or horizontal line provides an easy and valuable exercise in logical, planned decision making and in working with number lines. The documentation including objectives and lesson plans is very good. Sound, animation and graphics make this an enjoyable program and the instructional design is very good.

DISK TITLE: ELEMENTARY VOL.1, VER.3.3

PROGRAM TITLE: TAXMAN

TYPE: EDUCATIONAL GAME

SUBJECT AREA: MATHEMATICS

GRADE LEVEL: 5-6 READING LEVEL: 3.3

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: Taxman is a game which reinforces concepts related to skills in the factoring of numbers. In this program, the student and the computer start with a list of whole numbers in numerical order. The student decides how many. The student then takes a number from the list and the taxman gets all the factors of the numbers that are left. The student's number and all its factors are then deleted from the list. For example, if the list were 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10 and the student took 8, the taxman would get 1, 2, and 4 and the new list would be 3, 5, 6, 7, 9, 10. The taxman has to get something everytime and so the student can only pick a number that has factors left. When none of the remaining numbers have any factors, the taxman gets them. The student's score is the sum of the numbers he takes.

COMMENTS: The directions of this program would be difficult for some students to follow. It does require students to think carefully about what the factors of all the numbers of the list are so that he can try to outsmart the taxman, but it seems that the taxman has too much of an advantage in that the student cannot choose a number that has no factors for the taxman. Since the winner is determined by adding up the numbers the computer and the student have taken, it seems the taxman always wins. Documentation is available.

DISK TITLE:	ELEMENTARY VOL.1, VER. 3.3
PROGRAM TITLE:	BAGELS
TYPE:	EDUCATIONAL GAME
SUBJECT AREA:	MATHEMATICS; PLACE VALUE; LOGIC
GRADE LEVEL:	3-6 READING LEVEL: 2.6
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 U.S./DISK

DESCRIPTION: The computer thinks of a number and the student tries to guess that number. He has the choice of working with two, three or four digit numbers. When he tries to guess the number, the computer displays his guess on the right of the screen while giving a word - Pico, Fermi or Bagels - which indicates whether one digit is correct but in the wrong position, one digit is correct and in the right position, or no digits are correct.

COMMENTS: As an educational game involving logical planning and patient concentration, this program is useful and enjoyable for students of many age levels. The only problem seems to be in remembering what the words stand for. The documentation helps with this problem. The choice of level of difficulty is good, and the program is interactive and friendly. Errors in entering responses are handled very gently, but no graphics are employed nor are they really suitable for this program. A visible record of guesses tried is kept for the student on the right of the screen.

DISK TITLE:	ELEMENTARY SCHOOL, VOL.1, VER.3.3
PROGRAM TITLE:	CHANGE
TYPE:	DRILL AND PRACTICE/SIMULATION/GAME
SUBJECT AREA:	MATHEMATICS
GRADE LEVEL:	3-5 READING LEVEL: 3.8
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 U.S./DISK

DESCRIPTION: This is a program to help students learn to make change by having them imagine that they are a check-out person in a store. The computer gives the purchase amount and the amount given the student for payment. The student then is asked to select the correct number of coins and bills to give the customer in change for his purchase from his change tray. As he makes his decision, the number he has chosen shows in the appropriate section of the change tray. If he has made a mistake, he is given the option of seeing the correct answer or trying again. If he does it correctly but inefficiently, the computer will tell him and allow him to try again or see the other way. He can do as many problems as he likes or have the option of going to another program on the disk. The program will not keep track of his correct answers.

COMMENTS: This is a very useful and well designed program. It requires that the student know the value of coins and the denominations of bills and that he add and subtract correctly. At a higher level of involvement, he is asked not only to give the correct change, but to do it in the most efficient manner. Documentation, including objectives and lesson plans is available.

DISK TITLE: ELEMENTARY VOL.1, VER.3.3

PROGRAM TITLE: METRIC LENGTH

TYPE: DRILL AND PRACTICE

SUBJECT AREA: MATHEMATICS

GRADE LEVEL: 5-6 READING LEVEL: 3.4

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: This is an exercise in converting from one unit of metric length to another. The units include the millimeter, centimeter, meter and kilometer. The computer gives a length in one unit and the student is asked to convert it to another unit. He is given three tries per problem. The rules for metric conversion are provided. The student is also given the choice of how many problems he would like to do. If he makes three incorrect responses, the correct answer is given. His score is presented at the end of the program and if he has done poorly, the computer suggests he review the rules.

COMMENTS: This is a strictly utilitarian drill and practice program in metric conversion. It s one bad feature is that it presents the rules for conversion at the beginning of the program but does not give the student the option of seeing them again when he needs the rules to help him with a question. However, the student can refer to the accompanying documentation.

DISK TITLE: ELEMENTARY SCHOOL, VOL.1, VER.3.3

PROGRAM TITLE: METRIC 21

TYPE: DRILL AND PRACTICE

SUBJECT AREA: MATHEMATICS

GRADE LEVEL: 2-6 READING LEVEL: 3.8

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: This is a game of metric blackjack which is much like the card game of blackjack or twenty-one. Each player is given two random lengths in centimeters, from one centimeter to ten centimeters, printed as a line approximately the correct number of centimeters long. The computer is the dealer and gives itself two lengths also, but shows the student its first length only when all players have finished with the round. The object is for the student to get as close to but not over twenty-one centimeters. The student can take no more than 5 lengths before the computer takes its lengths.

COMMENTS: As an exercise in estimating and visualizing metric lengths, this program has value. Documentation is provided.

DISK TITLE: ELEMENTARY VOL.1, VER.3.3

PROGRAM TITLE: SPEED DRILL

TYPE: DRILL AND PRACTICE

SUBJECT AREA: MATHEMATICS

GRADE LEVEL: 2-6 READING LEVEL: 3.4

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: This is a drill on math problems which tests adding, subtracting, multiplying and dividing. The student can choose which operation to practice, the level of difficulty and the speed of the response time. At the end of the program, the student receives two scores - the percent he had correct and the challenge score which depends on the level of difficulty he chose, the rate of speed and the percent he did correctly.

COMMENTS: This is strictly drill and practice with a choice of difficulty that is not too noticeable in the problems presented. Colour and sound are used. The sound may be a distraction when the program is used by an individual student but is good if the program is used by a group. As a speed drill it is good.

Excellent documentation including objectives and lesson plans is provided.

DISK TITLE:	ELEMENTARY VOL.1, VER.3.3
PROGRAM TITLE:	TENS
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	MATHEMATICS
GRADE LEVEL:	5-6 READING LEVEL: 2.9
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 U.S./DISK

DESCRIPTION: This program gives the student practice in multiplying numbers ending in zero. The student chooses how many problems he would like. He is allowed two incorrect answers before the correct answer is given. His score is given at the end of the program.

COMMENTS: This is a no frills drill and practice routine on multiplying numbers ending in zero. No graphics, sound or branching is used.

Excellent documentation including objectives and lesson plans is provided.

DISK TITLE: ELEMENTARY VOL.1, VER.3.3

PROGRAM TITLE: ROUND

TYPE: DRILL AND PRACTICE

SUBJECT AREA: MATHEMATICS

GRADE LEVEL: 4-6 READING LEVEL: 2.7

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: This program is a drill on rounding whole numbers. The computer gives the student a number and asks him to round it off to the nearest tens, hundreds, or thousands. The student is given twelve problems and has a time limit of ten seconds for answering. If he does not answer within the time limit, the correct answer is given. His score is presented at the end of the program.

COMMENTS: As a drill on rounding, this is very useful. It is interactive and thorough. It contains no graphics or sound. There is no tutoring provided if an incorrect response is given, but the program will tell the student his answer is too large or too small.

MECC's documentation including objectives and lesson plans is excellent.

DISK TITLE:	MATH SEQUENCES
PROGRAM TITLE:	TWELVE SEQUENCES DESCRIBED BELOW
TYPE:	MANAGED DRILL AND PRACTICE
SUBJECT AREA:	MATHEMATICS
GRADE LEVEL:	1-8
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	PRINTER OPTIONAL
MEMORY REQUIREMENT:	48K
D.O.S.:	3.2
DISTRIBUTOR:	MILLIKEN PUBLISHING COMPANY
APPROXIMATE PRICE:	$525.00 U.S. ($789.00 WITH 12 BACK-UP DISKETTES)

DESCRIPTION: Milliken's Math Sequences Grades 1-8 Revised Edition contains twelve diskettes, a Teacher's Guide, four duplicating masters, and an "Easy-Does-It" card (step by step guide to operating the computer).

As specified by the developers, the Sequences provide drill and practice for students in grades 1 through 8 on math operations that have already been introduced by the teacher. Further, in the Teacher's Guide, the developers claim that the material correlates with concepts presented in most basic mathematics texts and that a minimum amount of daily drill "enhances students' mathematical skills and increases their achievement".

The user level is specified as grades 1-8, but it has been demonstrated that senior secondary students requiring remediation in basic mathematical operations find the material appropriate, particularly as the instructor can specify a graphical or textual reinforcement message, dependent on the age or preference of the intended user.

No formal diagnostic test is provided to enable the teacher to identify specific areas of weakness and to help in prescribing materials at the appropriate level of difficulty or of problems of a particular type. However, once the teacher has identified an area of weakness, entry levels within the Sequences can be determined by consulting the scope and sequence chart provided in the Teacher's Guide. Using the chart, the teacher can identify the problem types contained within a particular Sequence, and determine the problem levels on the diskette where each problem type can be found. The teacher's information diagnosis can be further confirmed by studying the example problems for each level provided at the back of the Teacher's Guide.

The student can then be assigned a specific problem level and the program will assess his competence at that level, either promoting him rapidly through a series of problem levels, lowering his level, or suggesting that he should see his teacher for assistance. The teacher has some control over the diagnostic/evaluation procedure in that the mastery level, the failure level, and the minimum number of problems per level can be specified.

Thus, the student can enter the Sequence randomly initially and then proceed sequentially to more complex levels of the same mathematical operation. The Sequences themselves follow a sequential development from Number Readiness through Addition, Subtraction, Multiplication, Division, Laws of Arithmetic, Integers, Fractions, Decimals, Percents, Equations and Measurement Formulas.

The range of topics within the Sequences is typical of the operations generally covered in an elementary mathematics curriculum. The scope of the problem levels within each Sequence is adequate although a number of the teachers interviewed felt that there was not enough variation in problem type and approach to provide sufficient material for enrichment, remediation, or recycling nor to permit the thorough reinforcement or review of concepts previously taught.

In the analyst's opinion, the Number Readiness Sequence in its present form should not have been included in the package. The Sequence requires that the student be able to read and follow directions and to work independently. Students needing number readiness material generally require instructions from a teacher.

In a typical lesson the student uses the keyboard and screen as pencil and paper. A problem is presented on a screen that is easy to read and attractively displayed. A question mark appears where the student is to enter his response. As soon as the student types a response, the question mark moves to the next step in answering the question.

The program is designed so that it operates at the pace of the student at the keyboard who can proceed as slowly or as quickly as he chooses. There is, however, a slight delay between the time when the student hits return to continue and the generation of a new problem. More serious to the teacher attempting to take advantage of a student's enthusiasm, is the long delay in initially loading the program.

If the question is the type in which students typically calculate the answer mentally before entering a response, the input is from left to right. If the question needs to be "worked out", input is from right to left. Unfortunately, there is a subtle range of problem levels in which confusion arises as the brighter student is forced to enter the "whole" answer from right to left or the slower student is forced to resort to pencil and paper when the program asks that an answer be entered from left to right. However, the directions to the user are clear and a question mark always appears where input is expected to be entered.

Every effort has been made to simulate a pencil and paper exercise. For example the student can choose to take a short cut and do a question by short rather than long division. He can "try out" responses in long division and erase his answer when he realizes he has estimated incorrectly, and he can use the space bar to regroup if he is having difficulty keeping track of his calculations.

Feedback is immediate and the number of attempts the student is allowed is dependent on the complexity of the problem. For example, in a simple problem with only two given choices, the student has only one chance for a correct response. Problems such as long division which require a large number of inputs are given extra chances.

Once the student misses the problem the allowable number of times, a large red X flashes on the screen signifying that the entire problem is wrong. From the results of field tests, it is evident that both students and teachers felt that this feedback was too harsh.

The teachers who participated in the field test also felt that when the computer offers to show the student how to do a question, the student should be allowed to "step in" and complete the question if he feels that he can continue. A number of teachers also indicated that rather than asking students to "Study the Answer", a concrete representation of the concept using animation and graphics might be used. All of the Sequences lend themselves readily to this type of approach.

On the other hand, teachers were enthusiastic in their praise of the animated reinforcement message which signals a correct response. This device is very motivating for young children and even the older children seemed to prefer the graphics reinforcement to the textual reinforcement message.

No previous teacher training is necessary for successful implementation of the Math Sequences into the regular classroom and the established curriculum. However, it is cautioned in the Teacher's Guide that teachers follow Apple's explicit instructions for setting up the equipment.

In addition, a brief section in the Teacher's Guide offers suggestions as to how the package might be used more effectively by individual students and by small groups in classrooms, resource centres, and curriculum labs.

An evaluation process based on assignments specified by the teacher is incorporated into the management system. The mastery level, failure level, the level at which problems are generated, and the number of problems at each level are determined by the teacher. Consequently, the evaluation process, testing strictly cognitive skills, is continuous from problem level to problem level.

There is no formal summative evaluation to assess the student's performance over an entire Sequence. However, since a student cannot proceed from one problem level to another without demonstrating mastery, it can be inferred that the final problem level evaluation is an indication of the student's having mastered all levels to that point.

The management system, bypassed by students using the Sequences on an informal basis, can only be entered by students and teachers who have a password. The system provides the teacher with a tool for completely individualizing instruction within the classroom. Using the class or student management page, the teacher can specify three assignments for each student, small group, or class. A record is kept of each student's progress and a hard copy report can be generated specifying assignments completed and incomplete, problem levels where the student encountered difficulty, and the percentage achieved on each completed assignment. With the present system capabilities and design, the teacher can receive a report only on the last three assignments specified.

Although the instructions provided in the Teacher's Guide are very clearly presented, there are idiosyncrasies to the system which require an initial period of exploration by the teacher. For example, after the student has been told to see his teacher for a more appropriate problem level, the program will generate problems at a lower level when the student "signs on" again. Even though in the second assignment the teacher may specify that the student enter the Sequence at a level below the first assignment, the program will not let him do so. Generally, however, the management system is excellent and after an initial familiarization on the teacher's part, it is very easy to use.

The Milliken Math Sequences can be highly recommended. The package demonstrates the exemplary use of colour,graphics, animation, branching and reinforcement techniques. The directions to the user are clear and the screen lay-out is easy to read and attractive. The developers have wisely chosen not to include sound effects which might be distracting in a regular classroom situation, and they have wisely chosen metric units in the Measurement Formulas Sequence. The package is user proof and the developers have solved the problems associated with using the microcomputer for "paper and pencil" drill and practice. The documentation is clear and comprehensive, and the package is compact and attractive.

Milliken's Math Sequences demonstrate an appropriate and effective use of the microcomputer in supplementing the regular mathematics program with individualized and managed drill and practice material.

In elementary mathematics, regular drill and practice of old and new skills and concepts is essential to basic mastery. The Microcomputer and Milliken's Math Sequences offer material tailored to the individual needs of each student in the class, free the teacher to pursue more creative and demanding activities, and reduce the time required for diagnosing problem areas, prescribing materials, marking assignments, and preparing reports.

For educators who are in the position of having to account for expenditures associated with microcomputer technology, this package is being used in schools in Canada all day, every day, and in some cases, the Math Sequences alone have justified to school boards and administrators their financial committment to microcomputers in the classroom.

DISK TITLE:	ELEMENTARY SCHOOL, VOL.4, VER.4.1
PROGRAM TITLE:	ESTIMATE
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	MATHEMATICS
GRADE LEVEL:	3-6 APPROPRIATE FOR REMEDIATION WITH OLDER STUDENTS. READING LEVEL: 3.7
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 U.S./DISK

DESCRIPTION: Estimate provides drill and practice on estimation in addition, subtraction, multiplication, division and percents. For each drill the student is asked how much time he would like to make his estimate, is given a choice of what size of numbers he wishes to practice on, the number of problems he wants, and whether he would like to work with two, three or four digit numbers or a mixture of all three. For each choice, the student is told what would be a good estimate. For instance, if he chose to work with two digit numbers, he is told that if his estimate is within five of the exact answer, it is a good estimate. After he has entered his answer, the program tells him if he is correct and then tells him the exact answer. After two incorrect responses, he is told that his answer should have been near the exact answer which is given.

COMMENTS: This is a "no frills" drill and practice program designed to be useful for a wide range of student interests and abilities.

DISK TITLE: ELEMENTARY SCHOOL, VOL.4, VER.4.1

PROGRAM TITLE: MATH GAME

TYPE: DRILL AND PRACTICE

SUBJECT AREA: MATHEMATICS: BASIC FACTS, REGROUPING

GRADE LEVEL: 3-7 SUITABLE FOR REMEDIATION FOR OLDER STUDENTS. READING LEVEL: 3.3

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: Math Game is a game which provides drill and practice on the four basic operations. Any number of players can compete at Math problems. They are allowed problem categories of addition, subtraction, multiplication, division or a mixture. Each player is given problems according to age and difficulty asked for. Points are scored according to how fast the correct answer is typed in. Each player is given three tries per problem. Bonus points, determined by age, difficulty and the number of correct answers given, are given at the end of the game.

COMMENTS: The best feature of this program is that a younger child can play against an older child and the computer will even out the competitors. Even though the program claims to be designed for five to forty year olds, the five year old level seems too difficult and the assignment of points seems rather arbitrary. However, it is useful drill in an enjoyable context for mathematics students. Documentation is available.

DISK TITLE: ELEMENTARY VOL.1, VER.3.3

PROGRAM TITLE: NUMBER

TYPE: EDUCATIONAL GAME

SUBJECT AREA: MATHEMATICS

GRADE LEVEL: 1-5 READING LEVEL: 1.9

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: In this game, the computer thinks of a whole number between 1 and the number the student gives it. The student must try to guess the number. After each guess the computer tells him if his guess was too big or too small. The computer displays all of the student's guesses and whether they are too big or too small.

COMMENTS: Because the student can decide the largest number the computer can choose, this program offers varying levels of difficulty. The directions are stated at a very simple level and are not very complicated. With help in understanding the directions, a kindergarten child learning his numbers could use this program. It provides a good drill and review on the order of numbers but is not terribly exciting. No graphics or sound are used. The hints offered are very appropriate for young children. It is accompanied by documentation.

DISK TITLE:	ELEMENTARY MATH EDU-DISC
PROGRAM TITLE:	ELEMENTARY MATH EDU-DISC
TYPE:	DRILL; TUTORIAL
SUBJECT AREA:	MATH
GRADE LEVEL:	2 - 5; REMEDIAL
LANGUAGE:	INTEGER BASIC
PERIPHERAL:	COLOUR MONITOR REQUIRED
MEMORY REQUIREMENT:	48K
D.O.S.:	3.2
DISTRIBUTOR:	MUSE SOFTWARE CO.
APPROXIMATE PRICE:	$39.95 U.S.

OBJECTIVES: Provides drill in the basic number facts and develops a visual interpretation of them.

DESCRIPTION: The program contains a single question arithmetic readiness test, and four categories of arithmetic questions dealing with the basic number facts for addition, subtraction, multiplication or division. No drills mixing operations are provided. A student unable to answer a given question correctly is provided with a visual illustration to explain how that fact is determined. Incorrect responses are clearly indicated. At the end of the lesson the student is provided with his or her score. The score is also recorded for teacher reference; data, including the skill level of the student, the number of correct responses, and number of questions attempted, is summarized and provided.

COMMENTS: Documentation is provided which clearly explains the program and its operation. The single question readiness test does not assist the student in determining the correct starting level. Despite the claim that little or no teacher assistance is required, students will likely need help in interpreting the tutorial graphics. Reading skills are necessary for the student to follow the program. Reinforcement is not strong or varied, and the program may not hold student interest for long without teacher encouragement. The program may serve the needs of some remedial students, and could also provide supplementary exercises helpful to the general student.

Bruce Green, March/81

DISK TITLE:	MECC ELEMENTARY MATHEMATICS VOL.1 VER 3.3
PROGRAM TITLE:	METRIC ESTIMATE
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	MATHEMATICS
GRADE LEVEL:	2.6 READING LEVEL: 3.8
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.2
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 disk U.S.

DESCRIPTION: This is a drill to develop skill in estimating linear segments in cm or mm. The student begins by selecting the number of questions he would like to practice with. He then makes two measurements in mm to calibrate the length of lines on the screen with the computer program. He may then select either the cm or the mm scale for practice.

A series of segments of various lengths are shown on the screen. Two attempts are allowed. After two incorrect responses, the correct answer is given. A delay of over 10 seconds will also result in the correct answer appearing in order to prevent the student from measuring rather than estimating. An answer within +/- 1 cm will be accepted as close and the correct response given. On the mm scale, an answer within +/- 2 mm is accepted as close. The program keeps track of the students score and presents it when all questions are completed.

COMMENTS: The cm drill will be most useful. With some practice, students should have little problem in developing enough skill to perform well on the drill.

The mm drill may prove frustrating to most students. A high degree of accuracy is required before an answer is accepted. The level of accuracy demanded appears to be well beyond the capabilities or needs of most people.

Documentation is available which briefly outlines lesson plans and provides a student worksheet for recording progress.

Bruce Green, March/81

DISK TITLE:	DK-INTROA
PROGRAM TITLE:	INTRODUCTION TO DECIMALS ON THE COMPUTER
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	MATHEMATICS
GRADE LEVEL:	2-5, READING LEVEL 3, SLOW LEARNERS, LD
LANGUAGE:	
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.2
DISTRIBUTOR:	EDUCATIONAL ACTIVITIES (VAN NOSTRAND REINHOLD IN CANADA)
APPROXIMATE PRICE:	$64.90 U.S. FOR DISK OF 2 PROGRAMS

DESCRIPTION: This program is modelled on Introduction to Mathematics except that it is concerned with the addition, subtraction, multiplication and division of decimals.

DISK TITLE:	MECC SECONDARY SCIENCE VOLUME 2
PROGRAM TITLE:	ICBM
TYPE:	SIMULATION/GAME
SUBJECT AREA:	MATHEMATICS
GRADE LEVEL:	JUNIOR/SENIOR SECONDARY
LANGUAGE:	APPLESOFT
PERIPHERAL:	NONE
MEMORY REQUIREMENT:	32K
D.O.S.:	3.2
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 disk U.S.

DESCRIPTION: This program is a simulation of an ICBM/SAM (surface to air missile) confrontation. The user is provided with the heading of the ICBM (in miles north and miles east of the user's location) and must then launch the SAM and alter its course so that it successfully intercepts the ICBM. The user alters the course by providing a heading in degrees (0 to 360). Documentation available.

COMMENTS: This program could possibly be used as an introduction to angle measurement except for the fact that the program author has chosen to represent north as zero degrees rather than the conventional representation of the horizontal as zero degrees. This fact, plus the inclusion of a spelling error (missle as opposed to missile) renders the program as not recommended.

DISK TITLE: AESTHEOMETRY VOLUME I

PROGRAM TITLE: PARABOLA

TYPE: TUTORIAL

SUBJECT AREA: MATHEMATICS

GRADE LEVEL: JUNIOR/SENIOR SECONDARY

LANGUAGE: APPLESOFT

PERIPHERAL: NONE

MEMORY REQUIREMENT:32K

D.O.S.: 3.2

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 disk U.S.

DESCRIPTION: This program demonstrates (using a high resolution animation sequence) how a plane and a right cone may intersect to form a parabola. The user does not participate beyond controlling pacing via the space bar.

COMMENTS: Well written and interesting. Doumentation available.

DISK TITLE: AESTHEOMETRY VOLUME 1

PROGRAM TITLE: DRAWING ELLIPSES

TYPE: PROBLEM SOLVING

SUBJECT AREA: MATHEMATICS

GRADE LEVEL: JUNIOR/SENIOR SECONDARY

LANGUAGE: APPLESOFT

PERIPHERAL: NONE

MEMORY REQUIREMENT: 32K

D.O.S.: 3.2

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 disk U.S.

DESCRIPTION: In this program, the user specifies the number of units on the horizontal axis, the value for the constant distance and the value for the focal length. The user then watches as the appropriate ellipse is drawn (in high resolution graphics) on the screen. The user may then change the various parameters and create a new ellipse.

COMMENTS: Very useful approach to drawing ellipses. However, the user must have been previously introduced to the nature of ellipses before successfully using this program.

DISK TITLE:	AESTHEOMETRY VOLUME I
PROGRAM TITLE:	ELLIPTICAL NATURE
TYPE:	TUTORIAL
SUBJECT AREA:	MATHEMATICS
GRADE LEVEL:	JUNIOR/SENIOR SECONDARY
LANGUAGE:	APPLESOFT
PERIPHERAL:	NONE
MEMORY REQUIREMENT:	32K
D.O.S.:	3.2
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 disk U.S.

DESCRIPTION: This program (using high resolution graphics sequences) demonstrates the nature of an ellipse and introduces terminology such as foci, major axis and minor axis. The user does not supply any input, but simply sits back and observes the demonstration (controlling program pacing via the space bar). Documentation available.

COMMENTS: Attractive, interesting program.

DISK TITLE: AESTHEOMETRY VOLUME I

PROGRAM TITLE: ELLIPSE

TYPE: TUTORIAL

SUBJECT AREA: MATHEMATICS

GRADE LEVEL: JUNIOR/SENIOR SECONDARY

LANGUAGE: APPLESOFT

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

D.O.S.: 3.2

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 disk U.S.

DESCRIPTION: This program (using high resolution animation sequences) illustrates how ellipses and circles may be defined in terms of sections of a cone. The user provides no input, but simply sits back and observes the animation sequences. Each sequence shows a plane intersecting a cone and thus forming an ellipse. Documentation available.

COMMENTS: Attractive animation clearly demonstrates the concept in question.

DISK TITLE:	AESTHEOMETRY VOLUME I
PROGRAM TITLE	HYPERBOLA
TYPE:	TUTORIAL
SUBJECT AREA:	MATHEMATICS
GRADE LEVEL:	JUNIOR/SENIOR SECONDARY
LANGUAGE:	APPLESOFT
PERIPHERAL:	NONE
MEMORY REQUIREMENT:	32K
D.O.S.:	3.2
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 disk U.S.

DESCRIPTION: This program demonstrates (using a high resolution animation sequence) how two branches of a hyperbola may be formed when a plane intersects two symmetrical, right, circular cones which are "reflected" in each other.

The user does not participate beyond controlling the pacing of the program via the space bar.

COMMENTS: Well written and interesting demonstration.

DISK TITLE:	DK-2004547A BASIC MATH COMPETENCY SKILL DRILLS
PROGRAM TITLE:	DECIMALS: ADDITION, SUBTRACTION, MULTIPLICATION, DIVISION
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	MATHEMATICS
GRADE LEVEL:	JUNIOR-SENIOR HIGH
LANGUAGE:	
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.2
DISTRIBUTOR:	EDUCATIONAL ACTIVITIES (VAN NOSTRAND REINHOLD IN CANADA)
APPROXIMATE PRICE:	$36.90 DISK U.S.

DESCRIPTION: The student can choose to practice adding, subtracting, multiplying, or dividing "plain" or "mixed", "long" or "short" decimals. Answers must be entered from left to right and the student has three chances to answer correctly. A correct response results in a "GOOD" and an incorrect response receives a "BOO HISS!" This program can be used with the "Grade Management System".

COMMENTS: This program cannot be recommended. As a result of field tests it was found that the numerical presentation was too small; the reinforcement and feedback was childish or insulting; neither the teacher nor the student could specify the number of problems to be worked; no directions were given as to how to escape from the pogram; the pace was too slow; and there is no score keeping function.

DISK TITLE:	DK 2004041A BASIC MATH COMPETENCY SKILL DRILLS
PROGRAM TITLE:	ADDITION, SUBTRACTION, MULTIPLICATION, AND DIVISION OF WHOLE NUMBERS
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	MATHEMATICS
GRADE LEVEL:	JUNIOR-SENIOR HIGH
LANGUAGE:	
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.2
DISTRIBUTOR:	EDUCATIONAL ACTIVITIES (VAN NOSTRAND REINHOLD IN CANADA)
APPROXIMATE PRICE:	$36.90

DESCRIPTION: In this series of programs, the student types in the name of the operation he would like to work on and chooses "easy" or "hard" problems. Answers must be entered from left to right and in difficult questions the student must use paper and pencil. If he answers correctly, a "GREAT!" appears on a new screen. If an incorrect answer is entered the student will be told in which column the error occurs and asked to try again. After three incorrect attempts he is asked if he would like to give up. If he answers, "Yes" he is told the correct answer and the program sometimes returns to the menu and sometimes asks again if he would like to give up. Occasionally, when an incorrect answer is entered a number of characters fill the screen and a large "YECCH!" is spelled out with the comment, "You're way off. Do it over."

The program can be combined with the "Grade Management System" for record keeping.

COMMENTS: This program cannot be recommended. The numerical presentation is too small; the reinforcemet and feedback at times is insulting; there is no indication of how to escape from the program; neither the teacher nor the student can specify the number of problems to be worked; answers must be worked out with pencil and paper; the pace is very slow; the program is inconsistent, occasionally returning to the menu unexpectedly after a "return"; and no score or instruction is given after a number of incorrect responses.

DISK TITLE: DK 2004041A BASIC MATH COMPETENCY SKILL DRILLS

PROGRAM TITLE: GRAPHS, MEAN, MEDIAN AND MODE

TYPE: TUTORIAL/DRILL AND PRACTICE

SUBJECT AREA: MATHEMATICS

GRADE LEVEL: JUNIOR-SENIOR HIGH

LANGUAGE:

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

D.O.S.: 3.2

DISTRIBUTOR: EDUCATIONAL ACTIVIT

APPROXIMATE PRICE:

DESCRIPTION: The student has the choice of working with GRAPH READING or MEAN, MEDIAN and MODE. The GRAPH READING program provides clear instructions about the purpose of the program - reading a graph - and teaches how to read a graph. A high resolution graphics example is provided showing the student how to read the example graph. The student then does an exercise with the computer indicating whether the student's answer is too large or too small. The student can try as many times as he likes until he answers correctly.

In the MEAN, MEDIAN and MODE program the terms are defined. The student is given a list of numbers and must find the median, mean and mode. If he anwers incorrectly, a textual "Boo Hiss!" or "Ouch" appears with a helpful suggestion for the student. After three incorrect attempts, the correct answer is given.

COMMENTS: The field test of this program indicated that both teachers and students found this to be a useful and well designed program.

DISK TITLE: METRIVERT

PROGRAM TITLE: METRIVERT

TYPE: STUDENT AND TEACHER AIDE

SUBJECT AREA: MATHEMATICS/METRIC SYSTEM

GRADE LEVEL: 7 - 12

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: EDU-WARE

APPROXIMATE PRICE: $15.95 U.S.

DESCRIPTION: This program will make conversions between the metric and English systems of measurement for the following types of measurement:

i) Length/Distance
ii) Area
iii) Volume
iv) Weight
v) Temperature

The user can generate a 'display page' made up of as many as twenty separate conversion calculations. All conversions are accurate to a minimum of three significant digits.

COMMENTS: No documentation is required to successfully run this program, as operation is self-explanatory. Output is relatively easy to follow, although no graphics or sound effects are utilized. This program appears to accomplish little that could not be accomplished with a pocket calculator and a table of conversion factors and, as such, would probably have limited use in an educational setting.

DISK TITLE:	ELEMENTARY SCHOOL, VOL.1, VER.1
PROGRAM TITLE:	METDRL
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	MATHEMATICS
GRADE LEVEL:	6-9 (USEFUL FOR ANYONE WANTING A DRILL IN METRIC CONVERSION)
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 U.S./DISK

DESCRIPTION: This is a drill on metric conversion. The student is given a choice of which unit of measure he would like to practice with. The computer tells him how to do each one before he does the problems. He is given a choice of doing sixteen different conversions. He can also choose how many problems he would like. He must do the work in his head or on a piece of paper before entering the answer into the program. After three incorrect responses, the correct answer is given and he is given another problem. The program keeps track of his score and presents it when he has done as many problems as he has chosen.

COMMENTS: The student is given a list of sixteen different conversions he can do. This makes for a very flexible and comprehensive program but it also requires that the student write down the number of his choice as the list disappears before he is asked to enter his choice. To make it more complicated, only half the list appears on the screen at one time. The student must do the work on paper rather than on the screen and no tutoring is provided if he is consistently making errors. The example given before the exercise begins is useful. This program is strictly "no frills" drill and practice on metric conversion with MECC's very good lesson plans accompanying it.

DISK TITLE:	MATHEMATICS, VOL.1, VER.3
PROGRAM TITLE:	SNARK
TYPE:	EDUCATIONAL GAME
SUBJECT AREA:	MATHEMATICS
GRADE LEVEL:	7-11 READING LEVEL: 6
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 U.S./DISK

DESCRIPTION: A snark hides on a 10 x 10 grid and the student tries to catch him. The computer asks the student to type the X co-ordinate of a gridpoint and then press the return key. Then he is asked to type in the Y co-ordinate. The program then asks for a 'radius'. The student must enter the radius of a circle centered on the gridpoint whose X,Y co-ordinates he has just entered. The computer then tells him whether the snark is inside his circle, outside his circle or on his circle. If the student thinks he knows where the snark is hiding, he is to enter 0 (zero) as the radius.

COMMENTS: This is an enjoyable game requiring concentration and logical, ordered thinking.

DISK TITLE: MATHEMATICS, VOL.1, VER.3

PROGRAM TITLE: POLYGRAPH

TYPE: PROBLEM SOLVING

SUBJECT AREA: MATHEMATICS; ALGEBRA

GRADE LEVEL: 9 AND UP READING LEVEL: 9

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: This program will plot any mathematical relation expressed using "X" as the independent variable, and "Y" as the dependent variable. All equations must be in the form: y = expressions, or y 2 (y2) = expression (for conics). Once a relation is plotted, the user may choose one of six options concerning the screen window. He can look above or below the screen window, to the left or right, zoom in or zoom away from the screen window. An equation such as y = 2xx will give a line; y = (x+1)2, a parabola; y2 = 4 - x2, a circle; y = ATN (x/SQR (-xxx+1)), an inverse sine. All of these can be done on the same graph or a new graph can be created each time.

COMMENTS: The very good documentation is essential in this program. Otherwise it may be difficult to understand the directions for entering data. It allows the plotting of most relations in the x-y plane. After an initial plot one can move around the co-ordinate plane looking at various parts of the relation, or zoom in to capture the detail of a particular section of the relation. The intersection of several relations can be analyzed by plotting several relations on the same axis. It allows the investigation of many mathematical relationships without the tedium often associated with such exercises. It could be incorporated in topics concerning Cartesian co-ordinates, Graphing Concepts, Points and Distances in the Plane, Study of Conics, Limits, Continuity, Quadratics and Roots, Functions, Trigonemetric Functions and Properties, Differentiation, Slope Maxima and Minima, Approximations Using Series, Logarithms and Inverse Functions.

DISK TITLE:	MATHEMATICS, VOL.1., VER.3
PROGRAM TITLE:	SLOPE
TYPE:	PROBLEM SOLVING
SUBJECT AREA:	MATHEMATICS
GRADE LEVEL:	9-11 READING LEVEL: 9
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 U.S./DISK

DESCRIPTION: This program will graph up to five linear equations on one axis. Students are asked to type in the equations in the form: y = mx + B or x = B. When the return key is pressed to continue, the computer displays the x - and y - axes with units marked off on each. The student is then prompted to type in the first equation. After typing the equation and pressing the return key, the student then sees displayed a series of points that satisfy the equation given. It will plot five linear equations on the same graph, all in different colours. The program can also be used to explore quadrilaterals.

COMMENTS: A very useful, well designed program with excellent documentation.

DISK TITLE: MATHEMATICS, VOL.1., VER.3

PROGRAM TITLE: ICBM

TYPE: SIMULATION

SUBJECT AREA: MATHEMATICS

GRADE LEVEL: 9-12 READING LEVEL: 7

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: This is a simulation in which the student is to imagine that he is in a radar station when an enemy ICBM (Inter Continental Ballistic Missile) approaches telling the student its co-ordinates (in miles north and miles east of the radar station). The student must launch a surface-to-air missile (spelled missle in the program) (SAM) to intercept it. The students only control over the SAM is that he can aim it in any direction, both at launch and when it is flying. He inputs the direction (measured clockwise from north) in which he wants the SAM to travel. At the next radar scan, he is given the new co-ordinates of the ICBM and of the SAM and the distance between the two. He now must make corrections in the course of the SAM by entering a new direction. The student can destroy the ICBM by coming within five miles of it, at which time the SAM's heat-seeking sensors come into action and direct it to its target. Several accidents have been programmed to occur randomly to add an element of chance.

COMMENTS: A careful study of the suggested strategies in the documentation is necessary to fully explore and appreciate this simulation. There is a strategy suggested for each level of interest and ability.

DISK TITLE: MATHEMATICS VOL.1, VER.3

PROGRAM TITLE: ALGEBRA

TYPE: DRILL AND PRACTICE

SUBJECT AREA: MATHEMATICS

GRADE LEVEL: 9-12 READING LEVEL: 8

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: Algebra provides drill and practice in solving equations in one variable. The computer thinks up equations with one variable in the form AX + B = D or AX + B = CX + D where X is the variable and A, B, C and D are constants. Students are given a choice of either form or a random selection of both. An explanation is given on how to solve the equation. The explanation is as follows:

> Use the addition property of equality and then simplify the equation.
>
> Use the addition property of equality again if variable appears on both sides of the equal sign and then simplify the equation.
>
> Use the multiplication property of equality (except where the coefficient of the variable is one) and then simplify the solution.

When multiplying, students are asked to use fractions instead of decimals and are given abbreviations for simplification, the addition property, and the multiplication property.

COMMENTS: This program will permit the student to solve the equation only one way following steps in the order which the program dictates. Perhaps this is the correct way according to the directions but a student who takes another approach, perhaps using the addition property twice before simplifying each side is told that he is wrong. If he enters two or three incorrect responses, he receives the message, "You don't seem to understand what we are doing. I would like you to talk with your teacher and try again some other time. The next time you run this program, read the instructions carefully!" which could be very frustrating to the student who has tried to read the instructions carefully but still can't do the problem.

Documentation is available. As a drill program which guides students towards solving an equation with one variable, it is useful as long as the student and teacher realize the limitations of its design.

DISK TITLE: MECC SECONDARY SCIENCE VOLUME 2

PROGRAM TITLE: RADAR

TYPE: SIMULATION

SUBJECT AREA: MATHEMATICS

GRADE LEVEL: JUNIOR HIGH SCHOOL

LANGUAGE: APPLESOFT

PERIPHERAL: NONE

MEMORY REQUIREMENT: 32K

D.O.S.: 3.2

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 DISK U.S.

DESCRIPTION: In this program, the user watches a high resolution display simulating a radar screen. An enemy ICBM appears on the screen and the user must intercept it with a missile of his own. The user controls the direction of the intercept missile by specifying a direction (0 to 360 degrees). Documentation available.

COMMENTS: Due to both the choice of a coordinate system (zero degrees is due north) and to the nature of the subject matter, this program cannot be recommended.

DISK TITLE:	MATHEMATICS, VOL.1, VER.3
PROGRAM TITLE:	POLAR
TYPE:	PROBLEM SOLVING
SUBJECT AREA:	MATHEMATICS
GRADE LEVEL:	11 AND UP READING LEVEL: 8.5
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 U.S./DISK

DESCRIPTION: Polar is designed to plot relations given in polar co-ordinate form. All equations must use 'R' as the independent variable and 'O' (Theta) as the dependent variable. All equations must be in the form R = expression or R2 = expression. Once a relation is plotted, the user can look above or below the screen window, look left or right of the window, zoom in or zoom away from the window. An equation such as R = 3 - sin (o) will give a Limacon; R = 3 + cos (5* O) will produce a Rose Curve; R = O/6 will demonstrate a Hyperbolic Spiral; and R = 3/(2+2* cos (O)) will graph a parabola.

COMMENTS: Without the documentation, some users may have difficulty in entering the data to use the program. However, the documentation is very clear and the program is a useful one for constructing and investigating polar graphs without any of the frustration often associated with this exercise. The equation, however, is often plotted on a location which does not appear on the screen and sometimes it is difficult to bring it into view using the zoom, left, right, up and down options.

DISK TITLE:	AESTHEOMETRY VOLUME I
PROGRAM TITLE:	CURVE DEMO
TYPE:	DEMONSTRATION
SUBJECT AREA:	MATHEMATICS/ART
GRADE LEVEL:	ELEMENTARY/JUNIOR/SENIOR
LANGUAGE:	APPLESOFT
PERIPHERAL:	NONE
MEMORY REQUIREMENT:	32K
D.O.S.:	3.2
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 disk U.S.

DESCRIPTION: This program simply displays various types of curves which can be drawn using the technique described under the "CURVES" program description. The user provides no input and simply sits back and "watches the show". Documentation available.

COMMENTS: An interesting introduction to the topic of aestheometry.

DISK TITLE:	AESTHEOMETRY VOLUME I
PROGRAM TITLE:	CURVES
TYPE:	TUTORIAL
SUBJECT AREA:	MATHEMATICS/ART
GRADE LEVEL:	ELEMENTARY/JUNIOR/SENIOR
LANGUAGE:	APPLESOFT
PERIPHERAL:	NONE
MEMORY REQUIREMENT:	32K
D.O.S.:	3.2
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 disk U.S.

DESCRIPTION: This program demonstrates how specialized curves (ellipses, parabolas, hyperbolas etc.) may be drawn using a composite series of straight lines. This straight line technique is known as aestheometry, but may be familiar to many as "string art".

COMMENTS: Attractive program which could prove to be a very useful "stepping off" point for art and geometry classes on curve sketching.

DISK TITLE: STATISTICS

PROGRAM TITLE: STATISTICS

TYPE: STUDENT/TEACHER AIDE

GRADE LEVEL: 11 AND UP

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: EDU-WARE

APPROXIMATE PRICE: $15.95 U.S.

DESCRIPTION: The Statistics package contained on the disc allows the user to access the following programs:

- i) MEAN, VARIANCE, STANDARD DEVIATION
- ii) BINOMIAL DISTRIBUTION
- iii) NORMAL DISTRIBUTION PROBABILITY AND FREQUENCY
- iv) CHI SQUARE DISTRIBUTION
- v) CHI SQUARE TEST
- vi) T-TEST

COMMENTS: Little documentation is included or required, as the programs are self explanatory. However prior knowledge of what particular statistical analyses would best suit the user's data is a pre-requisite to fully utilize the potential of this statistical package.

DISK TITLE:	DK2004445A BASIC MATH COMPETENCY SKILL DRILLS
PROGRAM TITLE:	FRACTIONS: ADDITION, SUBTRACTION, MULTIPLICATION, & DIVISION
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	MATHEMATICS
GRADE LEVEL:	JUNIOR-SENIOR HIGH
LANGUAGE:	
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.2
DISTRIBUTOR:	EDUCATIONAL ACTIVITIES (VAN NOSTRAND REINHOLD IN CANADA)
APPROXIMATE PRICE:	$36.90 U.S. DISK

DESCRIPTION: The student has a choice of working with the addition, subtraction, multiplication, or division of "pure or mixed", "easy or difficult" fractions. He is instructed to type "H" if he can't get a problem and the correct answer will be shown to him.

In all four programs on this diskete the student is led step by step through the solving of a problem dealing with fractions. For example, if the problem is 21-5/11 - 9-6/8, the student is told he must first change the first number into a fraction. He is asked the numerator of the first and second numbers, the denominator of the first and second numbers, whether the first and second numbers should be inverted, whether there need be any cancelling, or any reducing of the final answer. Thus depending on the complexity of the problem, the program provides drill and practice or tutorial material.

COMMENTS: The Learning Assistance teacher who field tested this program found it to be very helpful. His only criticism was its lack of score keeping but felt in general that the basic operations in fractions were dealt with in a logical, interesting and well-displayed manner.

DISK TITLE:	COMPUTER ASSISTED MUSIC THEORY: DEVELOPED BY MECC, DISTRIBUTED BY APPLE
PROGRAM TITLE:	INTRODUCTION
TYPE:	DEMONSTRATION
SUBJECT AREA:	MUSIC THEORY
GRADE LEVEL:	SENIOR SECONDARY; ROYAL CONSERVATORY OF MUSIC GRADES 1 AND 2
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	APPLE
APPROXIMATE PRICE:	$50.00 U.S. DISK

DESCRIPTION: This program introduces the user to the features of the APPLE which are used in the Music theory programs.

COMMENTS: Good demonstration.

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DISK TITLE:	COMPUTER ASSISTED MUSIC THEORY: DEVELOPED BY MECC, DISTRIBUTED BY APPLE
PROGRAM TITLE:	RHYTHM: NOTE TYPES
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	MUSIC THEORY
GRADE LEVEL:	SENIOR SECONDARY; ROYAL CONSERVATORY OF MUSIC, GRADES 1 AND 2
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	APPLE
APPROXIMATE PRICE:	$50.00 U.S. DISK

Objectives: After completing this program, the student should be able to:

1. Identify dotted whole, whole, dotted half, half, dotted quarter, quarter, dotted eighth, eighth, and sixteenth notes and rests.
2. Specify how long a given note or rest should be held if a quarter note receives one beat.

Prerequisites: The student should know something about note and rest types and should know how to determine the number of beats a note or rest is to be held.

DESCRIPTION: This program tests the user's ability to recognize different types of notes and rests. It includes whole, half, eighth, quarter, and sixteenth notes and rests, as well as dotted versions of those notes and rests (except for sixteenth notes and rests). Note Types also asks the user to tell how long the note or rest should be held if a quarter note receives one beat. The user may choose to answer problems on only notes, only rests, or both notes and rests.

Because each problem has two parts, the user's score for Note Types will show two points for each problem answered correctly, displayed after ten questions.

COMMENTS: There are a lot of directions given in this program and although the abbreviations are given again along with each question, the student would likely forget what they stood for. There is no way of seeing what the abbreviations stand for unless the student goes back to the beginning of the program and runs it through again to the screen with the abbreviations. A very good drill and practice program.

DISK TITLE:	COMPUTER ASSISTED MUSIC THEORY: DEVELOPED BY MECC, DISTRIBUTED BY APPLE
PROGRAM TITLE:	NOTATION: TERMS
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	MUSIC THEORY
GRADE LEVEL:	SENIOR SECONDARY; ROYAL CONSERVATORY OF MUSIC, GRADES 1 AND 2
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	APPLE
APPROXIMATE PRICE:	$30.00 U.S. DISK

Objectives: Upon completion of this program, the student should know the meanings of 57 commonly used musical terms.

DESCRIPTION: Terms is a drill in music terminology. There are three levels of difficulty to choose from and the user may choose up to questions per level. A term is printed at the top of the screen. Below the term are three possible definitions. The student is to select the definition which most closely fits the term at the top of the screen. The definitions are labelled A, B, C, and the student types the letter which corresponds to the best definition. The correct answer is given after one incorrect response and the program keeps track of the score.

COMMENTS: A very good drill and practice program.

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DISK TITLE:	COMPUTER ASSISTED MUSIC THEORY: DEVELOPED BY MECC, DISTRIBUTED BY APPLE
PROGRAM TITLE:	KEYSIGNATURES
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	MUSIC THEORY
GRADE LEVEL:	SENIOR SECONDARY; ROYAL CONSERVATORY OF MUSIC, GRADES 1 AND 2
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	APPLE
APPROXIMATE PRICE:	$50.00 U.S. DISK

Objective: After running this program, the student should be able to identify all major and minor key signatures.

Prerequisites: The student should know the note names (see NAME THE NOTE) and be somewhat familiar with a procedure for identifying key signatures.

DESCRIPTION: Keysignatures is a drill in identification of key signatures. The student can work with only major keys, only minor keys or both major and minor keys. He also has a choice of how many problems he would like. The computer draws a key signature and the student has to type the name of the key. An example is given to show the student how to enter his answer. Graphics are used to draw a music score and a key signature. After one incorrect response, the correct answer is given. The computer keeps track of the student's score.

COMMENTS: Very good drill. As with all the music programs, there are quite a few textual directions to go through but they are clear and sequential.

DISK TITLE:	COMPUTER ASSISTED MUSIC THEORY: DEVELOPED BY MECC, DISTRIBUTED BY APPLE
PROGRAM TITLE:	VISUAL INTERVALS
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	MUSIC THEORY
GRADE LEVEL:	SENIOR SECONDARY; ROYAL CONSERVATORY OF MUSIC, GRADES 1 AND 2
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT	32K
D.O.S.:	3.3
DISTRIBUTOR:	APPLE
APPROXIMATE PRICE:	$50.00 U.S. DISK

Objective: After completing this program, the student should be able to identify any written interval.

Prerequisites: The student should be familiar with note names and key signatures.

DESCRIPTION: Visual Intervals is a program which gives the student practice in recognizing intervals in written music. The student chooses the maximum number of sharps or flats he wishes to use, which intervals he would like to be tested on and how many problems he would like. Once the student has made his choices he is told he will see two notes on a staff and he is to determine the interval between the notes. When answering, he is asked to use one of a dozen abbreviations shown. He is allowed one incorrect response. The program displays the number of questions he has answered correctly.

COMMENTS: As with a number of these music programs, they offer the user a wide choice of drills but this creates a problem in programming to accept all the possible responses. In this program, the student is given a list of twelve combinations of letters and numbers to abbreviate musical terms. The abbreviations are listed with the question but it's quite likely that the student will forget what they represent. For the student with a thorough knowledge of music theory, the abbreviations would likely be easier to remember.

DISK TITLE: COMPUTER ASSISTED MUSIC THEORY: DEVELOPED BY MECC, DISTRIBUTED BY APPLE

PROGRAM TITLE: RHYTHM: COUNTING

TYPE: DRILL AND PRACTICE

SUBJECT AREA: MUSIC THEORY

GRADE LEVEL: SENIOR SECONDARY; ROYAL CONSERVATORY OF MUSIC, GRADES 1 AND 2

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

D.O.S.: 3.3

DISTRIBUTOR: APPLE

APPROXIMATE PRICE: $50.00 U.S. DISK

Objectives: After completing this program, the student should be able to:

1. Interpret the meaning of time signatures.
2. Determine the number of beats a given note should be held in a specific time signature.

Prerequisites: The student should be able to recognize the various note types and determine their value in a time signature where a quarter note gets one beat.

DESCRIPTION: This program provides drill on time signatures, note and rest types, and counting. The screen displays a measure that needs to be completed by adding one note or rest. The user must determine the type of note or rest that should be added. The user must choose the time signatures for the problems, and may select any combination of these time signatures:

2	3	4	5	6	3	6	9	12
4	4	4	4	4	8	8	8	8

The user must also use abbreviations for the type of notes - these are the same abbreviations used for Note Types. One chance is given to answer each problem correctly. If a mistake is made, the program will display the correct note or rest.

COMMENTS: As this program is very complicated, it requires a lot of directions. Abbreviations are presented and then, necessarily erased. The student would likely have difficulty in remembering the abbreviations he was to use in entering his answers. A very good drill and practice program.

DISK TITLE:	COMPUTER ASSISTED MUSIC THEORY: DEVELOPED BY MECC, DISTRIBUTED BY APPLE
PROGRAM TITLE:	AURAL INTERVALS
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	MUSIC THEORY
GRADE LEVEL:	SENIOR SECONDARY; ROYAL CONSERVATORY OF MUSIC, GRADES 1 AND 2
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	APPLE
APPROXIMATE PRICE:	$50.00 U.S. DISK

Objective: After completing this program, the student should be able to identify any interval from a minor 2nd to a major 7th by ear.

Prerequisites: The student should be familiar with the concept of an interval and should be able to identify one or two intervals by ear.

DESCRIPTION: This program provides ear training exercises on interval recognition. The student specifies the intervals to be drilled, whether the tones will be presented going from low to high or high to low, and the number of problems to be presented. Twelve intervals are available and the student enters which ones he wants or all of them. Then he specifies how the intervals are to be played and finally, the number of problems he wants. The student sees the correct answer after one incorrect response. He can hear the interval as many times as he likes.

COMMENTS: A good drill and practice program allowing for a variety of levels of difficulty and use.

DISK TITLE:	COMPUTER ASSISTED MUSIC THEORY: DEVELOPED BY MECC, DISTRIBUTED BY APPLE
PROGRAM TITLE:	RHYTHM
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	MUSIC THEORY
GRADE LEVEL:	SENIOR SECONDARY; ROYAL CONSERVATORY OF MUSIC, GRADES 1 AND 2
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	APPLE
APPROXIMATE PRICE:	$50.00 U.S.DISK

Objectives: After completing this program, the student should be able to:

1. Know how a given rhythm pattern should be played.
2. Identify basic rhythm patterns by ear.

Prerequisites: The student should be familiar with the various note types and their interpretations.

DESCRIPTION: In this program, the student is drilled on recognizing rhythm patterns. He sees a rhythm pattern and then hears three rhythm patterns. He must decide which of the three choices matches the pattern he sees in the notes on the screen. The student may select from one of three levels of difficulty: 1)The exercises have three to five notes and consist of half, quarter, dotted quarter, and eighth notes; 2)the exercises have five or six notes and use quarter and eighth notes with some syncopation; and 3)the exercises have six or seven notes with some syncopation. In each exercise the students see two measures of music printed. The first is a measure of four quarter notes which establishes the tempo. The student can hear each possible answer and then enter which one he thinks is the correct answer. He can choose the level of difficulty and how many problems he wants. He is allowed one incorrect response and then the correct answer is given. A record is kept of his correct responses.

COMMENTS: The introduction and the directions for entering responses are long and somewhat complicated but clearly and carefully presented. A very good drill and practice program.

DISK TITLE:	APPLE MUSIC THEORY: MUSIC FUNDAMENTALS FROM MECC
PROGRAM TITLE:	SIGHT AND SOUND: MISSING NOTE
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	MUSIC THEORY
GRADE LEVEL:	SENIOR SECONDARY; ROYAL CONSERVATORY OF MUSIC GRADES 1 AND 2
LANGUAGE:	APPLESOFT BASIC
PRIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	APPLE
APPROXIMATE PRICE:	$50.00 U.S. DISK

Objectives: After completing this program, the student should be able to look at a pattern of four notes and a blank space (representing a missing note) and determine the pitch of the missing note after hearing the five notes played.

Prerequisites: The student should know note names (see NAME THE NOTE) and know at least some intervals by ear and sight (see AURAL INTERVALS and VISUAL INTERVALS).

Background Information: This program does not introduce new concepts, but rather reinforces those learned in programs such as VISUAL INTERVALS, AURAL INTERVALS, and NAME THE NOTE.

Skills learned through MISSING NOTE provide a good background for starting work on musical dictation.

DESCRIPTION: Missing Note provides drill in elementary melodic dictation. The screen shows a staff with a melodic pattern of four notes and a space. The space represents a missing note, which may occur anywhere in the pattern. After the Apple plays the pattern, the user must identify the missing note by name. The user specifies how many sharps or flats the key signature has and the maximum size of the intervals in the pattern. The user may hear the pattern as many times as desired before answering. The user gets two tries to name the missing note. After the response, the screen displays the correct note.

COMMENTS: A very good program.

DISK TITLE: COMPUTER ASSISTED MUSIC THEORY: DEVELOPED BY MECC, DISTRIBUTED BY APPLE

PROGRAM TITLE: NOTATION: ENHARMONICS

TYPE: DRILL AND PRACTICE

SUBJECT AREA: MUSIC THEORY

GRADE LEVEL: SENIOR SECONDARY; ROYAL CONSERVATORY OF MUSIC, GRADES 1 AND 2

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

D.O.S.: 3.3

DISTRIBUTOR: APPLE

Objective: After completing this program, the student should be able to identify note names that are enharmonically equivalent.

Prerequisites: The student should know the function of flats, sharps, double flats and double sharps. Ideally, the student should have access to a keyboard instrument or picture of a keyboard.

DESCRIPTION: This is a drill on enharmonic spellings. The student can pick from two sets of exercises. Set one consists of simple enharmonic spellings involving only sharps and flats. Set two involves double sharps and double flats. The student sees the name of a note printed on the screen and he is to type in the simplest enharmonic spelling of that note using the naming scheme provided. If the response is incorrect, the correct answer is given. The program gives the student's score at the end of the program. The student chooses how many problems he wants to do.

COMMENTS: This is one of the more unimaginative of the music programs, with no use of graphics but useful and well designed nevertheless.

DISK TITLE: COMPUTER ASSISTED MUSIC THEORY: DEVELOPED BY MECC, DISTRIBUTED BY APPLE

PROGRAM TITLE: CHORDS: TRIADS

TYPE: DRILL AND PRACTICE

SUBJECT AREA: MUSIC THEORY

GRADE LEVEL: SENIOR SECONDARY; ROYAL CONSERVATORY OF MUSIC, GRADES 1 AND 2

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

D.O.S.: 3.3

DISTRIBUTOR: APPLE

APPROXIMATE PRICE: $50.00 U.S. DISK

Objective: After completing this program, the student should be able to identify by ear arpeggiated major, minor, augmented, and diminished triads.

Prerequisites: Before using the program, the student should know the definitions of major, minor, augmented, and diminished triads and should be able to recognize major and minor thirds by ear.

DESCRIPTION: This is a drill on recognizing triads. In each exercise the student hears a triad and he must determine the type of the triad. He can use major and minor triads or can choose to include diminished and augmented triads as well. He can also select the number of exercises he will receive. The student hears triads played as a series of five notes - root, third, fifth, third, root. If he needs to hear it again, he can press the return key. The computer keeps track of the number of times he needs to have the triads repeated. The triads are number coded for entering the answer. The correct answer is given after one incorrect response and the program keeps track of the number of correct responses and the average number of times triads have to be repeated.

COMMENTS: A very good program with many options and clear directions.

DISK TITLE:	COMPUTER ASSISTED MUSIC THEORY: DEVELOPED BY MECC, DISTRIBUTED BY APPLE
PROGRAM TITLE:	CHORDS: SEVENTHS
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	MUSIC THEORY
GRADE LEVEL:	SENIOR SECONDARY; ROYAL CONSERVATORY OF MUSIC, GRADES 1 AND 2
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	APPLE
APPROXIMATE PRICE:	$50.00 U.S. DISK

Objective: After completing this program, the student should be able to recognize arpeggiated major, minor, dominant, half-diminished, and fully-diminished 7th chords by ear.

Prerequisites: The student should be able to identify major, minor, augmented, and diminished triads by ear.

DESCRIPTION: This is a drill in recognizing seventh chords. The student hears a seventh chord and must determine its type. He may choose to select only major, minor, and dominant seventh chords, or to use major, minor, dominant, half-diminished and full-diminished seventh chords as well. He can have one note as the root for all exercises or a different root for each. He can also select the number of exercises he will receive. He hears the seventh chords played as a series of seven notes-root, third, fifth, seventh, fifth, third and root. He can have the series repeated by pressing the return key. He enters his answer by entering the number assigned to each seventh chord. The correct answer is given after one incorrect response and the computer keeps track of the number of repetitions required.

COMMENTS: A very good program with a number of options for level of difficulty and area of concentration.

DISK TITLE:	COMPUTER ASSISTED MUSIC THEORY: DEVELOPED BY MECC, DISTRIBUTED BY APPLE
PROGRAM TITLE:	RHYTHM PLAY
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	MUSIC THEORY
GRADE LEVEL:	SENIOR SECONDARY; ROYAL CONSERVATORY OF MUSIC, GRADES 1 AND 2
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	APPLE
APPROXIMATE PRICE:	$50.00 U.S. DISK

Objective: After completing the program, the student should be able to tap out a variety of rhythm patterns accurately in 4/4 time.

Prerequisites: The student should be familiar with the various note types and their interpretation as well as being able to identify some simple rhythm patterns by ear.

DESCRIPTION: This program allows the user to use the Apple keyboard to practice rhythmic patterns. The user may select one of three levels of difficulty. For each problem, the screen displays two measures of music. The first measure always contains four quarter notes. The second measure varies from problem to problem. After looking at the two measures, to produce the displayed rhythmic pattern, the user taps the N key as if the Apple keyboard were an instrument. The first measure played (four quarter notes) sets the tempo for the two measures - the user may play the patterns at almost any tempo. If played incorrectly, the screen will show what was played, and the Apple will then play the pattern correctly.

COMMENTS: Very good program.

SUGGESTED PROGRAM APPLICATIONS

	PRICE	Elementary	Jr/Sr High	University	Amateur/Hobby
MUSIC COMPOSER LIBRARY					
MUSIC COMPOSER	$205.	x	x	x	x
DAC Board only with purchase of a Dictator or Mania Program or for multiple APPLE II's by schools	$115.				
ENVELOPE SHAPER	$ 40.		x	x	x
ENVELOPE CONSTRUCTION	$ 57.		x	x	x
TUNING AND TEMPERAMENT CONSTRUCTION	$ 57.		x	x	x
DIGISONG PAK, specify title, each:	$ 22.	x	x	x	x
AUTO DIGISONG PLAYER	$ 45.	x	x	x	x
EXPERIMENTER'S PACKAGE	$230.			x	
MMI'S "MASTER" LIBRARY					
MELODIOUS DICTATOR	$136.	x	x	x	x
RHYTHMIC DICTATOR	$136.		x	x	x
HARMONIOUS DICTATOR	$136.			x	x
INTERVAL MANIA	$136.	x	x	x	x
CHORD MANIA	$136.		x	x	x
MUSIC LOVER'S GUIDE TO COMPOSERS	$ 57.	x	x	x	x
MUSIC LOVER'S GUIDE TO MUSICAL SYMBOLS	$ 57.	x	x	x	x
MUSIC LOVER'S GUIDE TO ITALIAN TERMS	$ 57	x	x	x	x
MUSIC LOVER'S GUIDE TO MUSICAL INSTRUMENTS	$ 57.	x	x	x	x
MUSIC LOVER'S GUIDE TO GENERAL MUSIC TERMS	$ 57.	x	x	x	x
MUSIC LOVER'S GUIDE FOR TEACHERS	$ 57.	x	x	x	
MAESTRO'S MAGIC SPELLER	$ 35.	x	x		x
MMI'S "LEADERSHIP" LIBRARY					
MUSIC IN THEORY AND PRACTICE: A SUPPLEMENT	$250.			x	
DOREMI	$ 57.	x	x	x	x
NAME THAT TUNE	$ 57.	x	x	x	x
SIR WILLIAM WRONG NOTE	$136.		x	x	x
ARNOLD	$ 57.	x	x	x	x

Prices Subject To Change. Shipping Charges additional.

DISK TITLE:	COMPUTER ASSISTED MUSIC THEORY: DEVELOPED BY MECC, DISTRIBUTED BY APPLE
PROGRAM TITLE:	SIGHT AND SOUND: WRONG NOTE
TYPE:	DRILL AND PRACTICE
SUBJECT AREA:	MUSIC THEORY
GRADE LEVEL:	SENIOR SECONDARY; ROYAL CONSERVATORY OF MUSIC GRADES 1 AND 2
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	APPLE
APPROXIMATE PRICE:	$50.00 U.S. DISK

Objectives: After completing the program, the student should be able to look at a five note musical passage, hear it played, and determine which of the five performed notes did not match its written counterpart.

Prerequisites: The student should have some skills in interval recognition, both visual and aural (see AURAL INTERVALS and VISUAL INTERVALS).

Background Information: This program does not introduce new concepts, but rather reinforces concepts learned in programs such as VISUAL INTERVALS and AURAL INTERVALS.

Skills learned through WRONG NOTE strengthen sight reading ability and help students who may later be involved in teaching or conducting.

DESCRIPTION: This program helps the user practice comparing written and performed pitch patterns. The Apple plays a pattern of five notes, which the user sees on the screen. One of the notes is played off either a whole step or a half step. The user must decide which note was played wrong. The user specifies the maximum number of sharps or flats in the key signature and the maximum size of the intervals in the pattern.

COMMENTS: A good program.

DISK TITLE:	RHYTHMIC DICTATOR
PROGRAM TITLE:	RHYTHMIC DICTATOR: Ear Training Game
TYPE:	D & P
SUBJECT AREA:	Music
GRADE LEVEL:	4th Grade - Adult
LANGUAGE:	Applesoft
PERIPHERAL:	Micro Music DAC card, speaker or earphones
MEMORY REQUIREMENT:	48k
D.O.S.:	3.2
DISTRIBUTOR:	Micro Music Inc.
APPROXIMATE PRICE:	$136.00

DESCRIPTION: This package which incorporates a diskette, a user's guide and a sample data sheet, is designed to teach the basic skills of rhythmic dictation. In operation, the program will play a rhythmic phrase twice. The user is then required to identify the phrase by choosing from a menu of rhythmic examples. The program automatically adjusts to the user's ability, using a weighting routine which selects from eleven levels of rhythmic complexity. The level of difficulty is dependent on three factors:

i) tempo of rhythmic phrase
ii) length of the rhythmic phrase
iii) type of rhythmic pattern

The criterion for advancement to a higher difficulty level is 70% identification accuracy.

No student data is written to the disk for record keeping but, upon completion of a session, competency data is displayed on the screen and such data may be copied to the sample data sheet included in the package.

COMMENTS: An entertaining and educational package which should prove useful in a music classroom.

DISK TITLE: DOREMI EAR TRAINING GAMES

PROGRAM TITLE: DOREMI EAR TRAINING GAMES

TYPE: D & P

SUBJECT AREA: Music

GRADE LEVEL: Grade 4 - Adult

LANGUAGE: INTEGER BASIC

PERIPHERAL: Micro Music DAC card, speaker or headphones

MEMORY REQUIREMENT: 48k

D.O.S.: 3.2

DISTRIBUTOR: Micro Music Inc.

APPROXIMATE PRICE: $57.00

DESCRIPTION: The package is composed of a diskette, plus both user and teacher instructions. This ear training package is designed to teach students to aurally identify the individual degrees of a major scale. The program will accept both scale degree and solfeggio responses. The student listens to a major scale as many times as desired and then elects to hear a single tone from that scale. Once the tone is sounded, the student must identify it. Correct responses accumulating to an overall identification accuracy of 90% will automatically move the user up to the next level of complexity.

COMMENTS: A good basis for an ear training program.

At any time during a session, the user may examine a personal progress report, and when a session is terminated this information is transferred to a file accessible only to the teacher.

COMMENTS: A well written, very comprehensive package.

DISK TITLE: MAESTRO'S MAGIC SPELLER

PROGRAM TITLE: MAESTRO'S MAGIC SPELLER

TYPE: D & P

SUBJECT AREA: Music/Spelling

GRADE LEVEL: 4th Grade - Adult

LANGUAGE: Applesoft

PERIPHERAL: Micro Music DAC card, speaker or earphones

MEMORY REQUIREMENT: 48k (disk version);
32k (cassette version)

D.O.S.: 3.2

DISTRIBUTOR: Micro Music Inc.

APPROXIMATE PRICE: $35.00

DESCRIPTION: Consisting of a diskette, user's guide, data sheet and list of spelling words, this package is designed to teach students to spell common music terms, music expressive terms, names of composers, and names of musical instruments.

The user is shown a word and, when it disappears, is requested to correctly retype the word. After every ten words, a nice animation sequence shows the user how well s/he is doing.

The user initially can choose a level of difficulty. This level is determined by the difficulty of the word itself and by the duration of time for which the word is displayed on the screen. The program self-adjusts the difficulty level according to user response. It progressively increases presentation speed as long as words are correctly spelled 80% of the time on a first try. The program can also automatically advance to higher levels. If too many mistakes are made, the tempo will automatically slow down.

Upon completion of a session, the program will display a "report-card" of student performance which may be copied to an accompanying data sheet.

COMMENTS: Although spelling drills generally tend to be rather dull, this program livens things up a little with interesting graphics. However, the long, rather noisy introduction tends to be quite annoying.

DISK TITLE: MUSIC COMPOSER

PROGRAM TITLE: MUSIC COMPOSER

TYPE: Utility

SUBJECT AREA: Music

GRADE LEVEL: 4th Grade - Adult

LANGUAGE: Applesoft

PERIPHERAL: Speaker or headphones

MEMORY REQUIREMENT: 48k

D.O.S.: 3.2

DISTRIBUTOR: Micro Music Inc.

APPROXIMATE PRICE: $205.00

DESCRIPTION The Music Composer allows for the interactive transcription and playback of musical pieces. Music can be entered and edited either in literal code (EF3 representing an eighth note F in octave 3) or graphically using the Apple's forward and backward arrow keys. The user, in addition to entering and editing up to four separate musical voices, can change timbres from a preselected menu of timbres or create their own unique timbres.

The package consists of a sound production interface card which slides into either slot 2 or slot 4, a user's guide and a Music Composer floppy disk. The card has a built-in amplifier, so the user need only connect it to a speaker.

Music entry is relatively uncomplicated due, at least partially, to a well-written user's manual. The user simply specifies the following:

i) number of voices (1-4)
ii) timbre for each voice (1-7)
iii) meter (where # beats is 1 through 9; value for beat is 2,4,8 or 16)
iv) type of entry (literal-code or graphic)

Following this, the user simply enters the compose command and the music entry sequence begins. Notes for the four voices are entered vertically, with each vertical "slice" of time representing a "set" of notes. In this fashion, discordant sets of notes are easily recognized and just as easily edited. The user may, at any time, simply play the music or, if desired, have the music displayed graphically as it is played. With the use of the knob on paddle 0, the tempo at which the music is played can be altered. The button on the paddle will allow the user to step through the music one vertical "slice" at a time.

During the play sequence, the user specifies the starting point at which play will begin. In this fashion, the facility exists for choosing a particular set of bars for playback if the user does not wish to hear the entire piece.

As mentioned, the user can create unique timbres by specifying the number, volume and magnitude of the harmonies in a timbre. These user-created timbres may be saved to disk and recalled at a later date.

In a similar manner, the user may save compositions to disk for later recall.

Summary of Specifications

i) Music composer supports a four octave range of 25 equal-tempered chromatic steps. The range is from C1 (65.41 Hz) to C5 (1046.5 Hz)

ii) Triplets and ties are permitted in music entry and editing.

iii) Rhythmic durations range from whole notes to thirty-second notes. Dotted notes are permitted.

iv) 8k bytes of memory are reserved for storing music.

v) Tempo, controlled by Paddle (0), ranges from 0 to 255

vi) During literal-code entry, the code is:

r = rhythm
p = pitch base
a = accidental
o = octave

vii) Four voice music permits 744 sets, one voice music permits 1638 sets. A set is defined as one time unit equivalent to the smallest note value in the music.

viii) Tuning accuracy within .4 cents at the top of the scale. The music composer is tuned to A = 440.

COMMENTS: A well-produced and documented composition package. Some users may find the vertical entry system confusing at first but a little practice ought to overcome any difficulties.

DISK TITLE: MELODIOUS DICTATOR

PROGRAM TITLE: MELODIOUS DICTATOR

TYPE: D & P

SUBJECT AREA: Music

GRADE LEVEL: 4th Grade - Adult

LANGUAGE: Applesoft

PERIPHERAL: Micro Music DAC card, speaker or headphones

MEMORY REQUIREMENT: 48k

D.O.S.: 3.2

DISTRIBUTOR: Micro Music Inc.

APPROXIMATE PRICE: $136.00

DESCRIPTION: This package consists of a user's manual plus one floppy disk. The program is designed to teach the basic skill of melodic dictation with melodies composed of notes of equal duration selected from diatonic scales within the range of d3 to g4. Melodies are composed in the major keys of C to Eb major, and to A major and their relative minors. Different timbres are randomly selected in order to provide variety.

Although some user familiarity with the piano keyboard would prove advantageous, it ought not to be considered a prerequisite since a special command exists which will label the piano keys and staff displayed on the high resolution screen.

The program simply plays a melody, and the user indicates which notes make up the melody by selecting the piano keys which are part of the screen display. The user (or teacher) selects entry difficulty, but regardless of entry level chosen, the program will self-adjust the difficulty level according to how well the user is doing.

Upon completion of a session, a simple scoreboard summary of progress is displayed on the screen. Included in the package is a sample data sheet which a teacher or user might wish to use.

COMMENTS: The well written user's manual makes this an attractive package for both teachers and students to use.

DISK TITLE: INTERVAL MANIA

PROGRAM TITLE: INTERVAL MANIA: A Music Interval Practice Program

TYPE: D & P/Game

SUBJECT AREA: Music

GRADE LEVEL: 5th Grade - Adult

LANGUAGE: Applesoft

PERIPHERAL: Micro Music DAC card, speaker or earphones

MEMORY REQUIREMENT: 48k

D.O.S.: 3.2

DISTRIBUTOR: Micro Music Inc.

APPROXIMATE PRICE: $136.00

DESCRIPTION: Consisting of a diskette, user's guide, teacher's guide and data sheet, this package is designed to teach students to identify melodic and harmonic intervals both aurally and visually.

In visual mode, the user will see and hear an interval and must then select both interval size and classification from the menu displayed. Aural mode works in a similar manner, however, the user only hears the interval at first, with the interval being displayed only when it has been correctly identified.

The user can compete against the computer or a partner and, in addition, must work against a time constraint with elapsed time being displayed as a high-resolution moving hourglass.

The user can select from three levels of difficulty, this choice determining the number of intervals which must be correctly identified before the time runs out. In addition the user selects which clef to work in.

User's (and partner's) progress is displayed in scoreboard-fashion at the end of each exercise. The report may be recorded on the data sheet provided. In addition, the teacher may preselect the parameters which will determine order of difficulty. The teacher may preselect:

i) interval sizes
ii) interval classifications
iii) aural or visual mode
iv) clef
v) difficulty level

COMMENTS: This is an interesting, fast-paced and well documented game. Graphics are attractive throughout and the facility for preselecting order of difficulty is useful.

DISK TITLE: SIR WILLIAM WRONG-NOTE

PROGRAM TITLE: SIR WILLIAM WRONG-NOTE: A Musical Ear-Training Program

TYPE: D & P

SUBJECT AREA: Music

GRADE LEVEL: 5th Grade - Adult

LANGUAGE: Applesoft

PERIPHERAL: Micro Music DAC card, speaker or earphones

MEMORY REQUIREMENT: 48k

D.O.S.: 3.2

DISTRIBUTOR: Micro Music Inc.

APPROXIMATE PRICE: $136.00

DESCRIPTION Consisting of a diskette, teacher's guide and user guide, this package is designed to teach students to aurally recognize pitch errors in a harmonic context of four-voice chords. A basic knowledge of both musical notation and chord qualities should be considered a prerequisite for use of this package.

The user listens to a chord as many times as desired. Both the correct and incorrect versions of the chord are played. The user then selects which of the four voices of the chord is the wrong note. Prior to using the program, the user selects the chord type that is to be rehearsed. The following are available:

- major
- minor
- augmented
- diminished
- major-major seventh
- major-minor seventh
- minor-minor seventh
- major-diminished seventh
- diminished-diminished seventh
- augmented sixth

At the end of each exercise the user may choose to work with the same chord, a new chord of the same type, or a new chord type. The user can, at any time, request to see a progress report: the student may wish to copy this information onto the data sheet provided. Upon completion of a session, the user's progress report is stored on a file accessible only by the teacher.

COMMENTS: A comprehensive, useful package.

DISK TITLE: ARNOLD

PROGRAM TITLE: ARNOLD: A Music Ear Training Game

TYPE: D & P

SUBJECT AREA: Music

GRADE LEVEL: 5th Grade - Adult

LANGUAGE: Applesoft

PERIPHERAL: Micro Music DAC card, speaker or earphones

MEMORY REQUIREMENT: 48k

D.O.S.: 3.2

DISTRIBUTOR: Micro Music Inc.

APPROXIMATE PRICE: $57.00

DESCRIPTION: This package is made up of a single diskette, a comprehensive student guide, a teacher guide and a sample data sheet. The program is designed to teach students to aurally identify scale degrees within a tonal system, to perceive groups of pitches and ultimately to perceive entire melodies. The ability to understand the numbers or solfeggio syllables used to designate the music scale degrees ought to be considered a prerequisite.

Five levels of skill are provided, being organized as follows:

LEVEL	NOTES IN EACH GROUP	TOTAL NOTES	RANGE	TEMPO
BEGINNER	1	7	OCTAVE	SLOW
NOVICE	1	9	OCTAVE	MEDIUM SLOW
INTERMEDIATE	2	12	TWELFTH	MEDIUM
ADVANCED	3	15	TWELFTH	MEDIUM FAST
PROFESSIONAL	4	20	TWELFTH	FAST

The student is allowed to hear a music scale as often as desired and is then asked to both recall and enter the tones of a melody. Students may choose to work in scale degree numbers or in solfeggio syllables.

DISK TITLE: DAKIN 5 PROGRAMMING AIDS 3.3

PROGRAM TITLE: VARIOUS

TYPE: UTILITY

SUBJECT AREA:

GRADE LEVEL:

LANGUAGE: APPLESOFT/BINARY

PERIPHERAL: NONE

MEMORY REQUIREMENT: 48K

D.O.S.: 3.2

DISTRIBUTOR: DAKIN 5 CORPORATION, P.O. BOX 21187,
DENVER COLORADO, 80221

APPROXIMATE PRICE: $110.00 Canadian

DESCRIPTION: This diskette is designed to facilitate the development of Apple II programs using DOS 3.3. Twelve menu-driven programs are found on the diskette; these programs will:

(i) Enable the user to utilize a printer to produce easy to read program listings. The date, time, starting line, ending line and program title are specified by the user. These are used as a heading for the listing. The user may specify printer line length and, if the pagination option is selected, the printer page length.

(ii) Generate a line number cross-reference table for all lines of a BASIC program. An option exists for listing only those lines referred by GOSUBS.

(iii) Generate a variable cross-reference table for a BASIC program. The maximum sized program that can be referenced is 110 sectors.

(iv) Print or display selected records from random access text files. The user must specify the length of the file in addition to the file's name.

(v) Display and modify data from any sector in a diskette. The user may either specify the sector/track combination that is to be displayed or, alternately, specify the name of the program or file listed in the catalogue.

(vi) Copy any file or program from one diskette to another. The user specifies the name of the file or program as listed in the catalogue.

(vii) Copy diskettes in an intelligent manner by initializing the destination diskette, copying each track, and verifying that the information on the destination diskette corresponds exactly to that on the source diskette. The user has the option of deciding whether or not to copy DOS.

(viii) Allow the user to create, alter, print and remove entries from sequential text files (providing they have fewer than 91 characters between carriage returns). This utility also facilitates the creation of EXEC files.

(ix) Perform rapid calculations to an accuracy of twenty places. All four arithmetic operations are handled.

(x) Cause any normal text appearing on the screen to be directed to a printer when the user presses CTRL Z. The cursor must be visible in order to do this, and inverse and flashing characters are printed as normal text.

(xi) Provide a useful data entry subroutine which the user can incorporate into the other programs. The user can specify the format of acceptable responses.

(xii) Compress Applesoft program code, resulting in space saved and improved execution speed. Unreferenced code is removed and comments after referenced REM statements are also removed.

COMMENTS: Recommended.

DISK TITLE: PROGRAMMER'S AID

PROGRAM TITLE: VARIOUS

TYPE: UTILITY

SUBJECT AREA:

GRADE LEVEL:

LANGUAGE: APPLESOFT/BINARY

PERIPHERAL: NONE

MEMORY REQUIREMENT: 32K

D.O.S.: 3.2

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00/disk U.S.

DESCRIPTION: This diskette contains many useful programmer's utilities, some of which allow the user to:

(i) Edit both random access and sequential files.

(ii) Change floating point programs to text files.

(iii) List and copy files.

(iv) Determine the amount of free space available on a diskette.

(v) Determine if control characters are present in a catalogue or program.

(vi) Determine the memory location and length (in bytes) of binary files.

(vii) Create shape tables directly from the keyboard.

(viii) Create "skeleton" programs incorporating subroutines which generate upper and lower case characters on the high-res screen, create music, initiate a "press space bar to continue" prompt, underscore, etc.

(ix) Cause text to be dumped to a printer.

(x) Transfer shapes from one shape table to another.

COMMENTS: Highly useful series of utility programs. Documentation available.

DISK TITLE:	DOS 3.3 TOOLKIT
PROGRAM TITLE:	PROGRAMMER'S ASSISTANT
TYPE:	UTILITY
SUBJECT AREA:	
GRADE LEVEL:	
LANGUAGE:	APPLESOFT/BINARY
PERIPHERAL:	NONE
MEMORY REQUIREMENT:	48K
D.O.S.:	3.2
DISTRIBUTOR:	APPLE
APPROXIMATE PRICE:	$70.00

DESCRIPTION: The programmer's assistant will:

(i) Provide automatic line numbering when entering a program.

(ii) Renumber a program according to specifications.

(iii) Merge two programs.

(iv) Compress a program by removing remark statements.

(v) Determine the length (in bytes) of the program in memory.

(vi) Display any control characters present in your program.

(vii) Type the characters underscore ("_"), backslash ("\") and left bracket ("[") from the keyboard.

(viii) Create a variable cross-reference file of an

Applesoft program.

COMMENTS: Recommended.

DISK TITLE:	VERSAWRITER DISK 1, DISK 2
PROGRAM TITLE:	VERSAWRITER
TYPE:	Utility
SUBJECT AREA:	Any
GRADE LEVEL:	Any
LANGUAGE:	Applesoft
PERIPHERAL:	Versawriter Drawing Board
MEMORY REQUIREMENT:	48k
D.O.S.:	3.2
DISTRIBUTOR:	Versa Computing Inc., 887 Conestoga Circle, Newbury Park, CA91320
APPROXIMATE PRICE:	$249.00

DESCRIPTION: The Versawriter package consists of a twenty-five page reference manual, two diskettes and the drawing board itself. The Versawriter is apparently designed to be a low-cost mechanism for producing high-resolution pictures and shapes for the Apple II.

HARDWARE: The drawing board consists of a white plastic base covered by a thin sheet of transparent mylar. The drawing arm is a double jointed mechanism, with each joint consisting of a potentiometer. As every location on the drawing board's surface corresponds to a unique pair of potentiometer settings, the software translates these settings to high-resolution x,y coordinate pairs.

At the end of the drawing arm is a transparent disc with a marked centrepoint. The user moves the disc over the drawing surface in order to trace out a pattern.

Since the drawing arm is resistance based (just like the Apple II game paddles), the drawing board simply plugs into the Apple's game paddle socket. No interface card is required. Furthermore, since it is resistance that determines arm position, there is no problem with static electricity causing errors in the drawing path.

The manufacturer states a digitizing accuracy of 30 thousandths of an inch (exceeding the accuracy of the HIRES graphics screen itself), and a digitizing rate of 20 thousandths of a second.

SOFTWARE: The menu-driven Versawriter software allows for a multitude of user applications. The user may draw a picture using a thin trace line or, if desired, draw with an "electronic brush" of 6 different widths. When drawing in either of these modes, the standard high-resolution colours are available.

The user may alter the scale of the drawing by independently specifying x and y coordinate scaling factors. In this way, enlarged or reduced drawings may be created (over a range extending from 1/4 original size to 4x original size). By setting different x and y factors, the resulting drawing can be arranged to have selective distortion in either dimension.

The user may select a smoothing factor between 0 and 5, this is most useful when a drawing scale greater than one is selected.

When a closed figure has been drawn, it can be coloured in using the colour fill command. A total of 16 different colours are available for this function, these colours are mixed combinations of the standard 8 high resolution colours.

It is an easy matter to add both upper and lower case text to a picture at any time. The user may specify size, colour, direction (i.e. left to right, up to down, right to left, etc.) and font. The manufacturer provides an English and a Greek character font. The user could easily design alternate fonts using another Versawriter capability - shape table generation. When this option is selected, the user can create a new shape table or add shapes to a table which already exists on a disc or in memory. The user is provided with a sample table filled with electronic shapes often used in electronic schematic diagrams. In addition, a utility program is provided which allows the user to create such diagrams.

The user can elect to create drawings in low-resolution graphics as well as high-resolution. Furthermore a "skeleton" program is provided which will allow the user to incorporate Versawriter functions into user-designed programs.

Space does not permit a detailed description of all the Versawriter capabilities but suffice it to say that the software is easily used, highly functional, encompasses a very broad range of applications and is backed up by comprehensive, well written documentation.

COMMENTS: As the tone of the above article suggests, the Versawriter is an impressive device. Picture and shape table design is exceptionally easy to do, and the low price of the package is attractive. Although the drawing board is sturdy enough for an adult or responsible youngster, it should perhaps be mentioned that careless manipulation of the drawing arm (i.e. forcing the arm against the maximum allowable angle excursions) could cause damage and this factor should be considered before allowing students free access to the device. In general, however, the Versawriter is highly recommended.

DISK TITLE:	THE VOICE
PROGRAM TITLE:	THE VOICE EDITOR
TYPE:	UTILITY
SUBJECT AREA:	PROGRAMMER'S AID
GRADE LEVEL:	
LANGUAGE:	6502 ASSEMBLY LANGUAGE
PERIPHERAL:	NO
MEMORY REQUIREMENT:	48K
D.O.S.:	3.2
DISTRIBUTOR:	MUSE SOFTWARE INC.
APPROXIMATE PRICE:	$39.95 U.S.

DESCRIPTION: This program allows the user to build up a vocabulary of words which can be "spoken" through the Apple's built-in speaker. Facilities exist for providing the editor with words which have been previously recorded on cassette tape and then "fine-tuning" the computer generated version of the word for the best possible sound.

The user can, using BASIC POKES and CALLS, cause all words appearing in a BASIC PRINT statement to be spoken rather than (or as well as) displayed. Of course the words appearing in the PRINT statement must have already been defined by the user if they are not included in the vocabulary provided by MUSE. Soft switches also allow the user to turn the voice on and off, and to alter the tone of the voice.

COMMENTS: Voices can be added to the vocabulary list and used in a program with relative ease. However, the quality of the software generated speaking voice is quite poor and probably not suitable for use in CAI programs.

DISK TITLE:	SHAPE TABLES VOLUME I VER.2.1
PROGRAM TITLE:	VARIOUS
TYPE:	UTILITY
SUBJECT AREA:	GRAPHICS
GRADE LEVEL:	
LANGUAGE:	APPLESOFT/BINARY
PERIPHERAL:	NONE
MEMORY REQUIREMENT:	32K
D.O.S.:	3.2
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 disk U.S.

DESCRIPTION: This diskette holds 15 of MECC's most useful shape tables, each one of which contains many shapes. The user can take these shapes and transfer them to a different table using the MERGE program, or may transfer whole tables at a time using the BINARY FILE INFO program. The DRAW program allows the user to examine the shapes in any table, one shape at a time and the TABLES program allows the user to create unique shapes using keyboard strokes which trace a pattern on the high resolution screen. Finally, a skeleton program called GRAPHIC is provided. This program is designed to enable the user to display upper and lower case characters on the high resolution screen with relative ease. Documentation available.

COMMENTS: Highly useful series of utility programs. Recommended.

DISK TITLE: ELEMENTARY SCHOOL, VOL.4, VER.4.1

PROGRAM TITLE: SOLAR DISTANCE

TYPE: SIMULATION/DEMONSTRATION

SUBJECT AREA: ASTRONOMY

GRADE LEVEL: 3-6 READING LEVEL: 3.0

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: Solar Distance teaches concepts of distance in astronomy by having students make 'trips' to planets in various vehicles. It gives the student the time it would take to get to any object in the solar system assuming that earth is at its closest point to that object. The student can go to Mercury, Jupiter, Neptune, the Moon, Venus, Saturn, Pluto, Mars, Uranus and the Sun. He can travel in any of the following ways: walk, bicycle, car, plane, speed of light, tricycle, motorcycle, train or jet. He can choose to travel to different places or travel using different kinds of transportation. If he chooses to visit different places, the program will tell him his weight on that object. The number of years, days, hours, minutes and seconds to get there is calculated and as this calculation is done, high resolution graphics and animation are used to depict the student travelling to the planet by whatever mode of transportation he has chosen.

COMMENTS: This is an excellent program for illustrating the concepts of time, distance, and speed in the solar system. Excellent documentation accompanies it.

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DISK TITLE:	SCIENCE VOL.3, VER.4.3 ELEMENTARY VOL.4, VER.4.1
PROGRAM TITLE:	URSA
TYPE:	TUTORIAL/PROBLEM SOLVING SIMULATION
SUBJECT AREA:	ASTRONOMY
GRADE LEVEL:	5-6 READING LEVEL: 2.9
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 U.S./DISK

DESCRIPTION: In this program students are taught to tell time by looking at the stars. Students are shown graphic representations of Draco the Dragon, Cassiopeia, Cepheus, Ursa Minor, Ursa Major, and then are given directions as to how to find the North Star. The student can choose a date and time and the program will show what the stars look like at that hour. They are then shown rotating around the North Star. The student is also given the option of learning to tell the time by the stars.

COMMENTS: This is a complex, well designed and interesting program that teaches some interesting concepts in astronomy. The section in which students are taught to tell the time by the stars may prove difficult to some. The tutorial portion is very clearly and carefully designed with examples and illustrations. Excellent documentation accompanies it.

DISK TITLE: ELEMENTARY SCHOOL, VOL.4, VER.4.1

PROGRAM TITLE: ODELL WOODS

TYPE: PROBLEM SOLVING SIMULATION

SUBJECT AREA: BIOLOGY, ECOLOGY

GRADE LEVEL: 2-6 READING LEVEL: 2.2

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: This program is about the animals that live around Odell Woods. The student role plays an animal. There are three things built into the program which decides whether the student will make it through the woods. They are: 1)how well he survives an attack; 2)his hunger level; and 3)his injury level. He has the choice of being a rabbit, a mouse, a fox or a wolf. Once he has made his decision, he has four options in any given situation. He can 1)run; 2)ignore it; 3)eat it; or 4)chase it. The student, as whatever animal he has chosen, is placed in situations in which he must make decisions. The computer tells him the consequences of his decisions. The object, of course, is to survive.

COMMENTS: For students who don't see the complexities of situations, this program would be enjoyable. However, the wolf usually eats everything and the mouse runs from everything. The mouse is confronted with a grassy field. Some students would choose to run as grassy fields should be a threat to a mouse if there were a hawk around. However, if the student chooses this option, he is told, more or less, not to be so wasteful of energy as a grassy field won't hurt him. Graphics, colour and sound and more complex choices would have improved this program. Excellent documentation is available.

DISK TITLE: SCIENCE VOL.3, VER.4.3
ELEMENTARY VOL.4, VER.4.1

PROGRAM TITLE: ODELL LAKE

TYPE: PROBLEM SOLVING SIMULATION

SUBJECT AREA: BIOLOGY, ECOLOGY

GRADE LEVEL: 4-6 READING LEVEL: 3.2

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: In this program, a food web in Odell Lake is simulated. The user role plays a fish. After role playing all the fish, the student should be able to tell the relationships between the fish. The student is given five options as far as his actions in different situations are concerned. The lake and the fish are represented graphically. Depending on the option the student chooses, fish are seen eating or being eaten by other fish or by an osprey; they are shown escaping or ignoring other fish, or the student is told he has starved to death.

COMMENTS: Excellent documentation is available for this program. The graphics are very well done and the animation is highly amusing. A useful and most enjoyable program. Very well done.

DISK TITLE:	TIES SCIENCE-BIOLOGY/MISC.
PROGRAM TITLE:	TAG
TYPE:	SIMULATION
SUBJECT AREA:	ECOLOGY
GRADE LEVEL:	JUNIOR/SENIOR HIGH SCHOOL
LANGUAGE:	APPLESOFT
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	TIES
APPROXIMATE PRICE:	$30.00 U.S. PER SUBJECT AREA DISK

DESCRIPTION: The TAG program provides the user with an opportunity to investigate the size of a wildlife population through the technique of tagging and recovery.

TAG uses the large mouth bass population of a simulated farm pond as the study species. User inputs includes: the number of tagged bass released from the hatchery; the number of days after the release of the bass from the center of the pond that the sampling should be made; the X and Y coordinates of the site for the sampling; and the number of fish which should be sampled. The output includes the number of tagged and untagged fish caught at a site, and after several samplings and calculations, an evaluation of the accuracy of the student's results.

COMMENTS: A good introduction to mark and recapture ecological sampling techniques. However, output is completely textual and rather dull. Use of graphics (ie to illustrate pond coordinates) would have increased the effectiveness of the program.

DISK TITLE:	TIES SCIENCE-BIOLOGY/MISC.
PROGRAM TITLE:	STERL
TYPE:	SIMULATION
SUBJECT AREA:	ECOLOGY/SOCIAL STUDIES
GRADE LEVEL:	JUNIOR/SENIOR HIGH SCHOOL
LANGUAGE:	APPLESOFT
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	TIES
APPROXIMATE PRICE:	$30.00 U.S. PER SUBJECT AREA DISK

DESCRIPTION: This environmental program enables the user to explore the effects of application of pesticides and sterilization in controlling the growth of the screw-worm fly population.

An instruction option is included at the start of each run. The goal is to eliminate the one million male flies in a ten thousand square mile area thus destroying the total fly population. Pesticides or sterilization techniques may be used either separately or together in controlling the population. In either case the user specifies the days of the 75 day investigation period in which the eradication procedures are to be used.

Results of the input strategies for control are given by the computer in graphical form (time in days versus normal adult male fly population in millions). Also projected is the cost of the fly control and estimated damage. The needed time for a single run is approximately ten minutes.

COMMENTS: Very interesting and informative program.

Provides good insight into biological control mechanisms. Once again, output is completely textual.

DISK TITLE:	TIES SCIENCE-BIOLOGY/MISC.
PROGRAM TITLE:	RATS
TYPE:	SIMULATION
SUBJECT AREA:	ECOLOGY
GRADE LEVEL:	JUNIOR/SENIOR HIGH SCHOOL
LANGUAGE:	APPLESOFT
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	TIES
APPROXIMATE PRICE:	$30.00 U.S. PER SUBJECT AREA DISK

DESCRIPTION: This program simulates the growth pattern of a rat population in either a city or an apartment house. The user controls the conditions of growth and sets the time of report. The program prints a daily count of the rat population for any specified period of time.

The user inputs the type of environment, whether the computer or the user will determine the initial number of rats, the date for the report, the garbage level of the area, and the type and quantity of poison to be used for rat control. At this point, the program has the information necessary to determine the growth pattern of the rat population. For the specified period of time, a report is printed showing the total population and the distribution of the population age, the number of births and deaths, and the count of emigration and immigration. Upon termination of the run, a report is produced which lists the accumulated births, deaths, emigrations and immigrations for the entire run, the dollar values of the damage done by the rats, the cost of rat poison and the amount and type of poison left uneaten.

COMMENTS: A nice introduction to population dynamics and pest control. The computed data would be much more meaningful if displayed in graph form rather than the rather dull tabular form provided.

DISK TITLE: SCIENCE VOL.3, VER.4.3

PROGRAM TITLE: FISH

TYPE: TUTORIAL/SIMULATION

SUBJECT AREA: BIOLOGY

GRADE LEVEL: 7-9 READING LEVEL: 7-8

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: The fish program deals with concepts related to blood circulation in animals having a two-chambered heart. The student has a choice of seeing a lesson on blood circulation in a fish, answering some questions about blood circulation in a two-chambered system such as that of a fish or seeing a demonstration of blood circulation in such a system. In the first, the organs of the fish are shown and then the student watches a single blood cell travel through the fish's circulatory system to the various organs. In the second part, five questions are asked about the first part and the third part is a repeat of the first part. The program is accompanied by excellent documentation.

COMMENTS: Unfortunately, low resolution graphics is used in this program and the representation of the fish and its various organs is very crude. In the portion of the program in which the organs are sketched in, the head, heart, gills, fins, stomach, muscle, kidney and tail are sketched in with squares in approximately the right place. The muscles are represented as a square below the stomach. The head and tail are not properly termed as "organs" as represented in the program. The representation of the circulatory system is also crudely depicted. Each graphics demonstration is preceded by a textual explanation.

The directions for the second part in which questions are asked are not clear. The questions come only after hitting the space bar but the only direction is to hit the E to end the demonstration. The questions are poorly designed to test the students knowledge of blood circulation. The student is supposed to be able to end the program by hitting E but in some cases this produces no results.

DISK TITLE: SCIENTIFIC METHOD

PROGRAM TITLE: SCIENTIFIC METHOD

TYPE: TUTORIAL

SUBJECT AREA: SCIENCE

GRADE LEVEL: ELEMENTARY, JUNIOR HIGH

LANGUAGE: APPLESOFT

PERIPHERAL: NO

MEMORY REQUIREMENT: 48K

D.O.S.: 3.2

DISTRIBUTOR: MICRO POWER AND LIGHT CO.

APPROXIMATE PRICE: $25.00 CANADIAN

DESCRIPTION: This program is designed to introduce students to the concept of the scientific method. The program is based on the observation that water will boil when heated sufficiently. By simulating an experiment involving the boiling of water, the process of moving from observation to empirical law is illustrated.

COMMENTS: This program displays text very slowly and this tends to be annoying. There were also errors of grammar found in the program i.e. "Always water boils when it is heated sufficiently." Furthermore extensive use of the inverse and flashing mode of text display could prove troublesome for those users whose T.V. set is improperly tuned. Inconsistencies were also found within the program (liter and quart were used as examples for liquid measure, whereas pound and ounce were examples of measures for weight). However, the program does provide a superficial introduction to the concept of the scientific method.

DISK TITLE: TELLSTAR LEVEL 1

PROGRAM TITLE: TELLSTAR LEVEL 1

TYPE: UTILITY

SUBJECT AREA: SCIENCE/ASTRONOMY

GRADE LEVEL: JUNIOR/SENIOR HIGH SCHOOL

LANGUAGE: APPLESOFT

PERIPHERAL: GAME PADDLES

MEMORY REQUIREMENT: N/A

D.O.S.: 3.2

DISTRIBUTOR: INFORMATION UNLIMITED SOFTWARE INC.

APPROXIMATE PRICE: $39.95

DESCRIPTION: Essentially the same package as in level 2, except that Southern Hemisphere and Messier objects are not supported.

A detailed 37 page manual is included.

DISK TITLE: TELLSTAR LEVEL 2

PROGRAM TITLE: TELLSTAR LEVEL 2

TYPE: UTILITY

SUBJECT AREA: SCIENCE/ASTRONOMY

GRADE LEVEL: JUNIOR/SENIOR HIGH SCHOOL

LANGUAGE: APPLESOFT

PERIPHERAL: GAME PADDLES

MEMORY REQUIREMENT: N/A

D.O.S.: 3.2

DISTRIBUTOR: INFORMATION UNLIMITED SOFTWARE INC.

APPROXIMATE PRICE: $79.95 (U.S.)

DESCRIPTION: This package enables the user to see a high resolution graphics display of the sky from any location on Earth at any time of the year. The user may view the night sky from eight different compass directions, or even get a direct overhead view. Stars (of both high and low magnitude), planets, the sun, the moon (in various phases) and Messier objects (galaxies, nebulae, etc.) are displayed. All displays can be printed out on a Silentype printer. If the user selects "Identify" mode during a screen display, a cross-hair cursor may be moved around the screen with the game paddles. When the desired object has been located within the cross-hairs, a touch of the paddle button will provide the user with information about the object. Constellations may be superimposed on the high resolution display screen at the user's request.

The user may enter "Calculation" mode and request the computer to perform various astronomical conversions and provide data on Solar System objects. The computer can perform the following functions: (i)equatorial to horizontal conversion; (ii)horizontal to equatorial conversion; (iii)ecliptic to equatorial conversion;

(iv)precession since 1950 adjustments; (v)statistical information for Solar System objects.

A comprehensive 47 page manual is included.

COMMENTS: A very powerful and useful scientific tool. Highly recommended for Astronomy hobbyists and classroom teachers.

DISK TITLE:	MECC SECONDARY SCIENCE VOLUME 2
PROGRAM TITLE:	PEST
TYPE:	SIMULATION
SUBJECT AREA:	BIOLOGY
GRADE LEVEL:	JUNIOR/SENIOR SECONDARY
LANGUAGE:	APPLESOFT
PERIPHERAL:	NONE
MEMORY REQUIREMENT:	32K
D.O.S.:	3.2
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 DISK U.S.

DESCRIPTION: In this program the user takes on the role of a supervisor in charge of a pest control program. The user's job is to control insect pests without damaging the environment. The user may choose one of four different pest species and select from a menu of four different pesticides. For each turn (6 months), the user must select the pesticide application rate in pounds per acre. A description of the effects of the application on both pest and environment is then provided. The user must attempt to maintain a pest reduced, healthy environment for a period of five years. Documentation available.

COMMENTS: Although no graphics or sound are used the program is an interesting one and should prove useful during the study of an ecology unit.

DISK TITLE: MECC SECONDARY SCIENCE VOLUME 2

PROGRAM TITLE: SNELL

TYPE: SIMULATION

SUBJECT AREA: PHYSICS

GRADE LEVEL: JUNIOR/SENIOR HIGH SCHOOL

LANGUAGE: APPLESOFT

PERIPHERAL: NONE

MEMORY REQUIREMENT: 32K

D.O.S.: 3.2

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 DISK U.S.

DESCRIPTION: This program provides the user with a high resolution display showing two substances (each with a different index of refraction) which meet at a boundary. The user views a light beam as it passes through the two substances. Given the angle of incidence, the user must estimate the angle of refraction. By manipulation of the indices of refraction and the angle of incidence, the user explores the properties of Snell's law. Documentation available.

COMMENTS: An attractive, useful and well written program.

DISK TITLE: CHEMISTRY LAB SIMULATION #1
PROGRAM TITLE: CHEMISTRY LAB SIMULATION #1
TYPE: SIMULATION
SUBJECT AREA: CHEMISTRY
GRADE LEVEL: JUNIOR/SENIOR SECONDARY
LANGUAGE: APPLESOFT
PERIPHERAL: NO
MEMORY REQUIREMENT: 32K
D.O.S.: 3.2
DISTRIBUTOR: HIGH TECHNOLOGY INC.
APPROXIMATE PRICE: $100.00

DESCRIPTION: This diskette contains three chemistry experiments, each of which involve titrations. The process of titration is displayed via a high resolution animation sequence in full colour. Performing accurate titrations will allow the user to:

i) determine the concentration of an unknown acid;
ii) estimate Avogadro's number;
iii) obtain the equilibrium constant of a weak acid.

High resolution animation sequences also illustrate monomolecular layers on a glass plate and the operation of a pH meter.

No record keeping is made throughout the program.

COMMENTS: An extremely well done package. Highly recommended.

DISK TITLE:	POPULATION GROWTH
PROGRAM TITLE:	POPULATION GROWTH
TYPE:	SIMULATION
SUBJECT AREA:	ECOLOGY
GRADE LEVEL:	JUNIOR/SENIOR SECONDARY
LANGUAGE:	APPLESOFT
PERIPHERAL:	NO
MEMORY REQUIREMENT:	48K
D.O.S.:	3.2
DISTRIBUTOR:	COMPRESS INC.
APPROXIMATE PRICE:	$50.00 U.S.

DESCRIPTION: This educational package consists of a diskette and a student text (163pp.). The text is designed as a stand-alone unit although, ideally, it would be used in conjunction with the population growth diskette. The text is written in a programmed learning fashion, with question and answer frames covering six topics:

1. Population Growth
2. Density and Population Growth
3. Fluctuating Population Growth
4. Delayed Responses to Change in Regulating Factors
5. Emigration and Immigration
6. Age Structure and Survivorship

The program diskette allows the user to specify certain parameters (carrying capacity, growth rate etc.) for a computer generated population and then observe how the population changes with time. Four study units are covered in the program, these are: i)exponential growth, ii)density-dependent growth, iii)variations in carrying capacity, iv)delays in regulatory response.

COMMENTS: There is, unfortunately, no built-in facility for causing the population growth plots to be directed to a printer in this program. In addition the method in which long lots are "squeezed" onto the screen is somewhat confusing. Generally, however, this is an interesting and very useful package. Recommended.

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DISK TITLE: NUCLEIC ACID CONNECTION

PROGRAM TITLE: NUCLEIC ACID CONNECTION

TYPE: SIMULATION

SUBJECT AREA: BIOLOGY

GRADE LEVEL: JUNIOR/SENIOR SECONDARY

LANGUAGE: APPLESOFT

PERIPHERAL: NO

MEMORY REQUIREMENT: 48K

D.O.S.: 3.2

DISTRIBUTOR: COMPRESS INC

APPROXIMATE PRICE: $50.00 U.S.

DESCRIPTION: This program, via the use of high resolution graphics and animation, illustrates how a cell synthesizes different types of nucleic acids and then combines them into a complex that synthesizes a protein strand.

Once a sample allele has been created, the user can induce mutations by exposing the cell to various chemical and physical mutagens.

COMMENTS: Generally a good, informative program. However, a colour television or monitor is recommended as the diagrams and animation sequences are difficult to interpret on a black and white display.

DISK TITLE:	SCIENCE, VOL.3, VER. 4.3
PROGRAM TITLE:	MINERALS
TYPE:	TUTORIAL
SUBJECT AREA:	EARTH SCIENCE
GRADE LEVEL:	8 AND UP READING LEVEL: 5.6
LANGUAGE:	APPLESOFT BASIC
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 U.S./DISK

DESCRIPTION: This is a program to help the student find out what kind of mineral he is examining. The program lists twenty-nine minerals it can detect. The student needs paper, steel nail, quartz, his finger nail, glass and a streak plate. The program then asks questions about the mineral that the student is examining. After asking a few questions it tells the student what the mineral is. Excellent documentation is available.

COMMENTS: This is a well designed and interesting program. It would be useful to a science class in teaching them how to identify minerals through characteristic properties.

DISK TITLE: SCIENCE, VOL.3, VER.4.3

PROGRAM TITLE: QUAKES

TYPE: TUTORIAL AND PROBLEM SOLVING SIMULATION

SUBJECT AREA: EARTH SCIENCE

GRADE LEVEL: 7-12 READING LEVEL: 7-12

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 U.S./DISK

DESCRIPTION: Quakes is a tutorial and problem solving simulation dealing with the topic, 'How to Locate Earthquakes'. The student can choose to have an explanation, a lesson, or a quiz. The explanation provides information as to what seismologists do when an earthquake happens. It discusses what a seismologist is and what is meant by Richter scale and epicentre. The purpose of the simulation is to help the student learn how seismologists find the epicentre of an earthquake.

The second section of the program shows the student how to find the epicentre of an earthquake by explaining what is meant by primary wave and secondary wave. Waves are graphically represented on a seismograph and their rate of travel is given. Students are asked to calculate the distance a primary or secondary wave would travel in a given time. They then learn to calculate the epicentre of the earthquake by the time lag between the primary and secondary waves.

In the quiz section an actual earthquake is simulated. Reports from a number of stations (American) are given and the student is asked to locate the epicentre by moving a box onto the correct place on a U.S. map. The program then locates the epicentre and tells him if he was correct.

COMMENTS: This would be a frustrating pogram for some students as it would be difficult for them to compare their answer represented by a box in the correct location, with the program's answer which represents the correct answer as the point where three circles intercept.

No explanations on how to solve the problem are given. The graphics are good and the design of the program is effective. Excellent documentation is available.

DISK TITLE: THREE MILE ISLAND

PROGRAM TITLE: THREE MILE ISLAND

TYPE: SIMULATION

SUBJECT AREA: SCIENCE - Energy Topic

GRADE LEVEL: 8 - 12

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NO

MEMORY REQUIREMENT: 48K

D.O.S.:

DISTRIBUTOR:

APPROXIMATE PRICE: $39.95 U.S.

OBJECTIVE: To demonstrate the complexities of the operating details of a pressurized-water, nuclear-reactor power electric-generating system.

DESCRIPTION: The student is in the position of controlling the operation of a nuclear power station. He is required to activate and de-activate various components of the system in response to continuously changing conditions. Failure to respond correctly can lead to termination of the simulation through excessive financial loss, or through a melt-down disaster.

COMMENTS: The diagrams provided of the various systems (Urbines, Reactor Core, Pump House) are difficult to interpret. Hours of time would be required before anyone could hope to become familiar enough with the program operation to exercise intelligent control of the system. Most students will likely find their initial attempts at running this program frustrating.

Evaluated by Bruce Green, March/81

DISK TITLE: MECC SECONDARY SCIENCE VOLUME 2

PROGRAM TITLE: DIFFUSION

TYPE: UTILITY/DEMONSTRATION

SUBJECT AREA: CHEMISTRY

GRADE LEVEL: SENIOR SECONDARY

LANGUAGE: APPLESOFT

PERIPHERAL: NONE

MEMORY REQUIREMENT: 32K

D.O.S.: 3.2

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 disk U.S.

DESCRIPTION: This program simply calculates diffusion rates of gases relative to a reference gas. The user inputs the name and molecular weight of the reference gas, then inputs the names and molecular weights of the test gases. The screen then displays the percent relative diffusion rates of the test gases. Documentation available.

COMMENTS: The program does not utilize graphics or sound, and is relatively uninteresting. However it could prove useful at times in a chemistry class.

DISK TITLE:	MECC SECONDARY SCIENCE VOLUME 2
PROGRAM TITLE:	COLLISION
TYPE:	SIMULATION
SUBJECT AREA:	PHYSICS
GRADE LEVEL:	SENIOR SECONDARY
LANGUAGE:	APPLESOFT
PERIPHERAL:	NONE
MEMORY REQUIREMENT:	32K
D.O.S.:	3.2
DISTRIBUTOR:	MECC
APPROXIMATE PRICE:	$30.00 disk U.S.

DESCRIPTION: This program simulates the collision of two objects. The user specifies the mass, velocity and elasticity of the objects and then observes the collision (displayed in a high resolution animation sequence). The user then is presented with a chart illustrating the before/after values for both momentum and kinetic energy. The user may then select different values and observe more collisions. Documentation available.

COMMENTS: This attractive program is an excellent demonstration of the concepts of conservation of momentum and alterations of kinetic energy.

DISK TITLE: MECC SECONDARY SCIENCE VOLUME 2

PROGRAM TITLE: NUCLEAR SIMULATION

TYPE: SIMULATION

SUBJECT AREA: CHEMISTRY/PHYSICS

GRADE LEVEL: SENIOR SECONDARY

LANGUAGE: APPLESOFT

PERIPHERAL: NONE

MEMORY REQUIREMENT: 32K

D.O.S.: 3.2

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 disk U.S.

DESCRIPTION: This program simulates the counting of radiation from a radioisotope. The user selects an isotope and specifies the length of time to count background radiation, how long the experiment will last, how often to take counts of the radioisotope and the approximate total count taken on the first day of the experiment.

The user, if desired, may select an advanced counting technique which is statistically better than the basic technique. Since the results of such a technique are more difficult to interpret, beginners are suggested to select the basic counting technique.

After selecting these options, the user sees a chart display illustrating daily changes in total experimental count and background radiation. Documentation available.

COMMENTS: No graphics or sound effects are used in the program. Although the program tends to be somewhat dull, it could be useful in a science classroom.

DISK TITLE: MECC SECONDARY SCIENCE VOLUME 2

PROGRAM TITLE: CELL MEMBRANE

TYPE: SIMULATION

SUBJECT AREA: BIOLOGY

GRADE LEVEL: SENIOR SECONDARY

LANGUAGE: APPLESOFT

PERIPHERAL: NONE

MEMORY REQUIREMENT: 32K

D.O.S.: 3.2

DISTRIBUTOR: MECC

APPROXIMATE PRICE: $30.00 disk U.S.

DESCRIPTION: This program allows the user to take on the role of a cell membrane in an attempt to maintain the "vital signs" of a healthy functioning cell. The user can control the intracellular concentrations of water, sugar and waste molecules, as well as the concentrations of sodium, potassium and chloride ions. Safe concentration ranges for these materials are displayed on the screen and the user has the option of altering the intracellular concentration of one of the materials or of simply doing nothing. The user must be cautious when altering concentrations since changing the concentration of one substance invariably effects another (i.e. pumping out sodium ions causes the cell to gain potassium ions, use energy and therefore accumulate waste!). Furthermore, the cell is taking in water and using energy on a regular basis. If the user does not function well as a cell membrane, the cell will die. However, the user is given the option of trying again. A congratulatory notice appears if the cell is allowed to remain healthy long enough to reach maturity. Documentation available.

COMMENTS: This program is both interesting and fun. The display is strictly textual with no graphics or sound. Despite this small drawback, the program is recommended.

DISK TITLE: EVOLUT

PROGRAM TITLE: EVOLUT (Unit on Natural Selection)

TYPE: MODEL SIMULATION

SUBJECT AREA: SENIOR HIGH BIOLOGY

GRADE LEVEL: 11 AND UP

LANGUAGE: APPLESOFT BASIC

PERIPHERAL: NONE

MEMORY REQUIREMENT: 48K

DISTRIBUTOR: CONDUIT

APPROXIMATE PRICE: $30.00 U.S.

OBJECTIVE: This program enables the student to test the effect of variables such as population size, rate of selection, and number of generations on the composition of alleles in the gene pool.

DESCRIPTION: This program allows the student to investigate the operation of selective forces on certain characteristics controlled by a single gene or set of alleles through use of a model. A fairly thorough knowledge of genetic principles is assumed. Useful documentation is included for both teacher and student illustrating how the program can be incorporated into a unit of evolution. The program is an interesting example of how the computer can be utilized to eliminate tedious counting and calculations in the collection of data.

COMMENTS: The usefulness of this program is seriously limited by the lack of printout capabilities. Ideally, the student should be able to enter the variables under investigation, and obtain a printout for later analysis.

Also, the program goes well beyond the concepts many biology teachers will consider to be fundamental to the topic of evolution at the high school level. It might provide a useful enrichment activity for bright students who have a special interest in evolution and enjoy a challenge. Otherwise, it is seen as having little to contribute to most high school biology programs.

Evaluated by Bruce Green, March/81

DISK TITLE:	Moles & Formulas
PROGRAM TITLE:	Moles & Formulas (also Reader on same diskette)
TYPE:	Drill & Practice
SUBJECT AREA:	Chemistry
GRADE LEVEL:	11 & 12
PERIPHERAL:	a printer can be used
MEMORY REQUIREMENT:	32K Applesoft RAM or ROM
DISTRIBUTION:	J & S Software 140 Reid Avenue Port Washington, N.Y. 11050
APPROXIMATE PRICE:	$20 U.S.
DOCUMENTATION:	no

DESCRIPTION: This diskette provides teachers with a program which will generate drill and practice exercises in senior secondary Chemistry, and a program to keep records of the performance of individual students. The management program need not be used by the teacher.

There are nine types of questions. The student is presented with a problem. If his first answer is incorrect, he is given additional information or a clue as to how to solve the problem and is encouraged to try again. If he still answers incorrectly, he is given the correct answer with a brief explanation of how the problem was solved. His score, recorded in a file in the accompanying reader program, is based on the number correct on the first attempt.

Three problems of each type are generated automatically whether the student is doing well or poorly. The reinforcement is textual and appropriate for students of this grade level. Although no graphics are used, the textual presentation is fairly well organized and displayed. There is no choice of level of difficulty, number of problems generated, nor of score keeping procedures. Teachers may object to the manner in which the chemical formulas are displayed and to American spellings. The problems are of the following types:

1. 64 grams of oxygen occupies the same volume at S.T.P. as a sample of carbon dioxide gas. What is the weight of the carbon dioxide?

2. What is the mass in grams of 4 moles of N_2O_3, dinotrogen trioxide?

3. What is the molar mass, to the nearest whole number, of potassium sulfate, K_2SO_4?

4. How many moles of oxygen atoms are there in 2 moles of vanadium hydroxide, $V(04)_3$:

5. A compound is analyzed and found to contain 75% carbon and 25% hydrogen. Which is its empirical formula?
   1. CH 2. C_2H 3. CH_2 4. CH_4

6. How many moles are in $24x10^{23}$ molecules of nitric acid, HNO_3?

7. How many atoms are in 5 molecules of H_3PO_4, phosphoric acid?

8. How many moles of potassium oxide are in 376 grams of potassium oxide, K_20?

9. A liter of gas weighs 2 times as much as a liter of argon at the same temperature and pressure. What is the molecular weight of the unkown gas?

PROGRAM TITLE: Photosynthesis & Transport

TYPE: Practice

GRADE LEVEL: High School and Jr. College

SUBJECT AREA: Biology

SYSTEM REQUIREMENT: 32K Applesoft RAM or ROM

PERIPHERAL: No

DISTRIBUTOR: J & S Software
140 Reid Avenue
Port Washington, N.Y. 11050

APPROXIMATE PRICE: $19.50 U.S.
$75.00 U.S. for a set of 6
$150.00 for the complete package

DESCRIPTION: J & S Software has made a Biology demonstration program available for evaluation. The design of the Biology programs appears to be very similar to the design of the Chemistry programs (see the evaluation of Moles and Formulas). They are intended to be used by students who need additional practice and the programs have the following features:

1. wrong answers result in information plus another chance to answer the question. A second wrong answer to the question gives a complete explanation of the answer;
2. students not knowing the material can have more than twice as many questions to answer than a student who can always respond correctly;
3. a record is kept for the teacher of the grade and the number of questions answered.

In the demo program, Photosynthesis and Transport, a one paragraph introduction to the topic is presented before the questions begin. The questions may be of the multiple choice type or require a one word response. If the student answers correctly, a "very good, John!" and a series of beeps or a very childish, crudely drawn face appears on the screen with a "Right" below it. This type of reinforcement is not entirely suitable for high school or Junior College students.

If an incorrect response is entered, further information is provided and the question is asked again. A second incorrect response results in the correct answer being displayed and an explanation being given.

COMMENTS: Other than the reinforcement message, no graphics are used in this program. It simply provides a textual presentation of questions on a specific topic in Biology with further information or an explanation included when a wrong answer is entered. The program will also keep track of a student's score.

DISK TITLE:	TIES SCIENCE: PHYSICS/CHEM
PROGRAM TITLE:	SLITS
TYPE:	SIMULATION
SUBJECT AREA:	PHYSICS
GRADE LEVEL:	JUNIOR/SENIOR HIGH
LANGUAGE:	APPLESOFT
PERIPHERAL:	NONE
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	TIES
APPROXIMATE PRICE:	$30.00 U.S. (PER SUBJECT DISK)

DESCRIPTION: A physics simulation of Young's double-slit experiment on light. The user can explore the relationships among the parameters of wave length, distance between slits, and distance to screen, in the investigation of interference patterns.

An option is included for outputing an illustrative run with the wave length of 6000 angstroms, the distance between the slits of .5 millimeters, and the distance to the screen of 2 meters.

COMMENTS: Effectiveness of the simulation is reduced due to all information being displayed on the text screen. As such, there is not enough room on the screen to display a complete graph at any one time.

DISK TITLE: TIES SCIENCE: PHYSICS/CHEM

PROGRAM TITLE: LECHAT

TYPE: TUTORIAL/DRILL

SUBJECT AREA: CHEMISTRY

GRADE LEVEL: SENIOR HIGH SCHOOL

LANGUAGE: APPLESOFT

PERIPHERAL: NONE

MEMORY REQUIREMENT: 32K

D.O.S.: 3.3

DISTRIBUTOR: TIES

APPROXIMATE PRICE: $30.00 U.S. (PER SUBJECT DISK)

DESCRIPTION: This tutorial program checks understanding of LeChatelier's Principle by asking a series of five questions about equilibrium shifts in a randomly generated chemical reaction equation.

COMMENTS: Simple question and answer type of program. No graphics.

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DISK TITLE: TIES SCIENCE: PHYSICS/CHEM

PROGRAM TITLE: KINET

TYPE: SIMULATION

SUBJECT AREA: CHEMISTRY

GRADE LEVEL: SENIOR HIGH SCHOOL

LANGUAGE: APPLESOFT

PERIPHERAL: NONE

MEMORY REQUIREMENT: 32K

D.O.S.: 3.3

DISTRIBUTOR: TIES

APPROXIMATE PRICE: $30.00 U.S. (PER SUBJECT DISK)

DESCRIPTION: A classroom presentation designed to calculate equilibrium concentrations and graph the progress (concentration vs. time) from initiation to equilibrium for the general reaction A=P.

By varying the equilibrium constant it is possible to move the point of equilibrium on the concentration axis, and show the relative concentrations of product and reactant as a function of the value of the equilibrium constant.

The effect of different rate constants on the time it takes to attain equilibrium can also be shown.

COMMENTS: Useful introduction to the concept of equilibrium constants. Program must be used with documentation to be properly understood by students.

DISK TITLE:	TIES SCIENCE: PHYSICS/CHEM
PROGRAM TITLE:	DRIP
TYPE:	SIMULATION
SUBJECT AREA:	CHEMISTRY
GRADE LEVEL:	JUNIOR/SENIOR HIGH SCHOOL
LANGUAGE:	APPLESOFT
PERIPHERAL:	NONE
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	TIES
APPROXIMATE PRICE:	$30.00 U.S. (PER SUBJECT DISK)

DESCRIPTION: This simulation requires the user to find the concentration of an acid using an acid-base titration.

An option is included in the program for obtaining a list of detailed instructions. The user may select to run either a practice titration (acid concentration is given) or a real titration (acid concentration is unknown). In conducting the experiment, the initial volumes of the acid and base are specified. After each addition of a user specified amount of acid or base to the solution, the program indicates whether the resulting mixture is acidic, basic, or neutral. The objective is to reach neutrality sc that the necessary data is available to calculate the unknown concentration of the acid.

COMMENTS: Rather dry illustration of titration techniques No graphics are used.

DISK TITLE:	TIES SCIENCE: PHYSICS/CHEM
PROGRAM TITLE:	DECAY1
TYPE:	SIMULATION
SUBJECT AREA:	PHYSICS/CHEMISTRY
GRADE LEVEL:	JUNIOR/SENIOR HIGH SCHOOL
LANGUAGE:	APPLESOFT
PERIPHERAL:	NONE
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	TIES
APPROXIMATE PRICE:	$30.00 U.S. (PER SUBJECT DISK)

DESCRIPTION: This radioactive decay simulation illustrates the concepts of half-life and exponentiation via a casino game using radioactive playing chips.

During each round the user enters the percent of allowable error, with the odds increasing as the percent error decreases. The number of chips successively decreases, thus increasing the level of difficulty as the program runs. In each case, the exact number remaining is displayed following the user's entered value. The object of the game is to break the one million dollar bank (given an initial stake of one thousand dollars).

COMMENTS: Introduces the concept of half life in an entertaining fashion.

DISK TITLE: TIES SCIENCE-BIOLOGY/MISC.

PROGRAM TITLE: PHOSYN

TYPE: SIMULATION

SUBJECT AREA: CHEMISTRY/BIOLOGY

GRADE LEVEL: JUNIOR/SENIOR HIGH SCHOOL

LANGUAGE: APPLESOFT

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

D.O.S.: 3.3

DISTRIBUTOR: TOTAL INFORMATION EDUCATIONAL SYSTEMS (TIES)

APPROXIMATE PRICE: $30.00 U.S. (PER SUBJECT DISK)

DESCRIPTION: This interactive program allows the user to investigate changes in the rate of photosynthesis by varying the carbon dioxide concentration and light intensity.

Instructions are included in the program. The user may investigate the effect of light or carbon dioxide on the rate of photosynthesis. The entered values for light intensity must be between 0 and 30. while the entered values for carbon must be between 0 and .30. In either case the results indicating the rate of photosynthesis may be printed in either chart or graph form. or both.

COMMENTS: This program does not take advantage of the Apple's graphics capabilities. and graph plotting is done entirely with text characters. Unfortunately there is not enough room on the text screen to display a complete graph and. as such. the effectiveness of an otherwise useful program is reduced.

DISK TITLE: TIES SCIENCE-BIOLOGY/MISC.

PROGRAM TITLE: MALAR

TYPE: SIMULATION

SUBJECT AREA: SCIENCE/SOCIAL STUDIES

GRADE LEVEL: JUNIOR/SENIOR HIGH SCHOOL

LANGUAGE: APPLESOFT

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

D.O.S.: 3.3

DISTRIBUTOR: TIES

APPROXIMATE PRICE: $30.00 U.S. (PER SUBJECT DISK)

DESCRIPTION: MALAR simulates the attack phase of a malaria eradication plan. The user must try to eradicate malaria from a given area within five years. This may be done with or without a budget limitation.

Optional instructions are given with the program. The user must try to eradicate malaria by using any combination of four treatment methods.

COMMENTS: Interesting, informative and challenging program. Could prove to be very useful in a science or social studies class. Use of graphics could have made for a more attractive program.

DISK TITLE: TIES SCIENCE-BIOLOGY/MISC.

PROGRAM TITLE: pH

TYPE: SIMULATION

SUBJECT AREA: CHEMISTRY

GRADE LEVEL: SENIOR HIGH SCHOOL

LANGUAGE: APPLESOFT

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

D.O.S.: 3.3

DISTRIBUTOR: TIES

APPROXIMATE PRICE: $30.00 U.S. (PER SUBJECT DISK)

DESCRIPTION: This program consists of three laboratory investigations dealing with the pH specificity of enzymes. The first investigation deals with why many enzymes exhibit a bell shaped curve when their activity is plotted against different pH values. The second investigation is an introduction to the importance of structure in an enzyme. and the third exercise deals with a specific enzyme. acetylcholenesterase.

Instructions are contained in the program. The user sets the number and type of ionizable amino acids present. and whether or not each of the amino acids is in a charged condition. The user also sets the pH range for the experiment. Output for each run is in the form of a graph with the specified pH range plotted against the enzyme activity level

COMMENTS: Useful program but somewhat limited. as an entire graph (when a pH range of 0-14 is specified) will not fit on one screen.

DISK TITLE:	TIES SCIENCE-BIOLOGY/MISC.
PROGRAM TITLE:	LOCKEY
TYPE:	SIMULATION
SUBJECT AREA:	CHEMISTRY/BIOCHEMISTRY
GRADE LEVEL:	SENIOR HIGH SCHOOL
LANGUAGE:	APPLESOFT
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	TIES
APPROXIMATE PRICE:	$30.00 U.S. (PER SUBJECT DISK)

DESCRIPTION: This biochemical program investigates the lock and key model of enzyme action. The user can test various hypotheses by regulating the amount of enzyme. the type and amount of inhibitor.

An instruction listing option is contained in the program. The enzyme to be investigated is acetylcholinesterase. with the codes for the inhibitors being:

1 - Ammonium
2 - Dimethylamine
3 - Methylamine
4 - Prostigmine
5 - Trimethylamine
0 - No inhibitor

The user inputs the following information:

1. The amount of enzyme (0 to 3 millimoles)
2. Code number of the inhibitor to be investigated

3. The amount of inhibitor
4. Type of output (1 = chart, 2 = graph)

Thus this program can be used in an experimental setting of regulating variables and controls.

COMMENTS: Rather dull simulation, with no graphics features to stimulate interest.

DISK TITLE:	TIES SCIENCE-BIOLOGY/MISC.
PROGRAM TITLE:	HARDY
TYPE:	SIMULATION
SUBJECT AREA:	GENETICS
GRADE LEVEL:	SENIOR HIGH SCHOOL
LANGUAGE:	APPLESOFT
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	TIES
APPROXIMATE PRICE:	$30.00 U.S. (PER SUBJECT DISK)

DESCRIPTION: This program leads the user through the formulation of the Hardy-Weinberg Principle and assists the user in determining the proportion of individuals within a population that are homozygous dominant. heterozygous dominant or homozygous recessive with regard to a certain trait

During the first run of the program. the user receives a brief explanation of the Hardy-Weinberg Principle and a sample rate population to work with. The user specifies the number of rats to be sampled, and the computer will generate the number of rats showing the dominant trait and the number showing the recessive trait. The computer will also calculate and print out the proportin of rats showing the recessive trait. the frequency of the recessive allele. and the proportion and number of rats that are homozygous dominant. heterozygous dominant or homozygous recessive. On subsequent runs of the program. the user has the option of either using his/her own data or working with either of two rat populations generated by the computer. In each case. the computer will calculate and print out the proportion in the sample showing the recessive trait. the frequency of the recessive allele and the genotypic ratios for the population.

COMMENTS: This program essentially performs calculations and presents the resulting information in text form.

DISK TITLE:	TIES SCIENCE-BIOLOGY/MISC.
PROGRAM TITLE:	GRAZE
TYPE:	SIMULATION
SUBJECT AREA:	ECOLOGY
GRADE LEVEL:	JUNIOR/SENIOR HIGH SCHOOL
LANGUAGE:	APPLESOFT
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	TIES
APPROXIMATE PRICE:	$30.00 U.S. (PER SUBJECT DISK)

DESCRIPTION: This program deals with the ecology of a grasslands region and allows the student to vary animal population in order to attain an ecological balance. The flora and fauna balance is quantitatively compared by regulating the population of cattle, songbirds, and hawks which indirectly affect the number of grasshoppers and rodents per acre in the three square mile sample.

The user must enter values for the three controllable variables: cattle, songbird, and hawk populations. A chart is then printed listing the year, in half year increments, and populations of cattle, songbirds, hawks, rodents per acre and grasshoppers per acre. After two years a relative score is printed which on a scale of 0 to 99 indicates quantitatively if an ecological balance has been attained. Then a complete fifteen year chart may be printed or just the summary results of the study.

COMMENTS: Interesting program, illustrating the difficulties in maintainng an ecological balance. However display of the data in graph form rather than tabular form, and the avoidance of statistics like "15.2 hawks" would increase acceptability of the program.

DISK TITLE:	TIES SCIENCE-BIOLOGY/MISC.
PROGRAM TITLE:	GENE2, GENE3
TYPE:	SIMULATION
SUBJECT AREA:	GENETICS
GRADE LEVEL:	JUNIOR/SENIOR HIGH SCHOOL
LANGUAGE:	APPLESOFT
PERIPHERAL:	NO
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	TIES
APPROXIMATE PRICE:	$30.00 U.S. (PER SUBJECT DISK)

DESCRIPTION: This set of programs allows a student to investigate the genetic traits of a teacher-generated model.

The teacher selects pairs of mutually exclusive traits. specifying in each pair the dominant trait. Also trait pairs may be designated as being sex-linked. Using the program GENE3 this information is loaded into a file. GENE2 is the program used by the student to investigate the genetic traits of the "thing" the teacher has loaded into a file. The same file name should be used in this program that was used in GENE3. The genetic traits are studied by mating various phenotypes and observing the frequency of each trait in the offspring. The student may regulate the type of cross (mono or dihybrid). the number of offspring. and the parent phenotypes from the pair listings. The program prints out the number and phenotype of the offspring. Usng this data the student may then determine the genetic structure dominant. recessive. and sex-linked traits of the "thing" loaded in the file by the teacher.

A user may repeat results by answering yes to the question "Do you want repeatable results?" If yes. then the number entered must be the same number used in the run to be duplicated.

COMMENTS: A very useful pair of programs in which a teacher may "create" an organism with a specific set of genetic characteristics, and then test whether students, by experimentation, can discover and explain these characteristics.

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DISK TITLE: TIES SCIENCE-BIOLOGY/MISC.

PROGRAM TITLE: GENE1

TYPE: SIMULATION

SUBJECT AREA: GENETICS

GRADE LEVEL: JUNIOR/SENIOR HIGH SCHOOL

LANGUAGE: APPLESOFT

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

D.O.S.: 3.3

DISTRIBUTOR: TIES

APPROXIMATE PRICE: $30.00 U.S. (PER SUBJECT DISK)

DESCRIPTION: This simulation investigates the inheritance of genetic traits for a varying number of offspring, and demonstrates the statistical nature of the Mendelian Laws.

The Mendelian assumptions used in the model are that:

1. Genetic traits are independent and non-sex-linked;
2. Each allele of a trait has an equal probability of transmission to the offspring;
3. One allele is clearly dominant. while the other is clearly recessive.

The user inputs the two alleles of the genetic trait being investigated, and specifies which is dominant and which is recessive. An assignment of dominant or recessive classifications is then made for each of the two genes for each parent. Finally the user inputs the number of offspring to be examined. A detailed report may be printed showing both the genotype and phenotype of each offspring. only if the number of offspring is less than two hundred. A genotype and phenotype ratio will be output for every run.

COMMENTS: A good illustration of the basic monohybrid cross ratios. No graphics.

DISK TITLE: TIES SCIENCE-BIOLOGY/MISC.

PROGRAM TITLE: AFLIFE

TYPE: SIMULATION/GAME

SUBJECT AREA: ECOLOGY

GRADE LEVEL: ELEMENTARY/JUNIOR HIGH/SENIOR HIGH

LANGUAGE: APPLESOFT

PERIPHERAL: NO

MEMORY REQUIREMENT: 32K

D.O.S.: 3.3

DISTRIBUTOR: TIES

APPROXIMATE PRICE: $30.00 U.S. (PER SUBJECT DISK)

DESCRIPTION: This program generates population patterns for successive generations based on the model used in John Conway's Game Of Life. Rules for birth, death, and survival are employed to simulate the effects of overpopulations, mobility, and periodicity.

The program requests that the user input the initial population pattern. The user enters a cell with life as an X and empty cells as dots. The maximum number of cells per row is forty and the maximum number of rows is thirty-two. When finished entering the initial pattern, the program then produces successive generations until either the total population dies or the program is terminated.

COMMENTS: Standard textual representation of the game. Very slow.

DISK TITLE: TIES SCIENCE:PHYSICS/CHEM

PROGRAM TITLE: SCATR1. SCATR2, SCATR3

TYPE: SIMULATION

SUBJECT AREA: PHYSICS

GRADE LEVEL: SENIOR HIGH SCHOOL

LANGUAGE: APPLESOFT

PERIPHERAL: NONE

MEMORY REQUIREMENT: 32K

D.O.S.: 3.3

DISTRIBUTOR: TIES

APPROXIMATE PRICE: $30.00 U.S. (PER SUBJECT DISK)

DESCRIPTION: These programs simulate physics laboratory experiments of alpha particle scattering to study atomic structure. SCATR1 contains a simulation of Rutherford's experiment using a thin gold foil and the 5 MeV alpha particles emitted by radioactive polonium. This program permits students to gather information concerning the scatterng of alpha particles from the gold foil. SCATR2 produces theoretical angular distribution graphs for three atomic models to allow students to compare "actual" and theoretical results. The theoretical models include the hardsphere model of kinetic theory. the plum-pudding model of J.J.Thomson, and Rutherford's nuclear model. SCATR3 calculates and plots trajectories for alpha particles scattered from individual Rutherford-type atoms, demonstrating the scattering mechanics so that students may see how the angular distribution graphs of SCATR2 were produced.

COMMENTS: All three programs are useful. but limited in effectiveness due to solely textual display.

DISK TITLE:	TIES SCIENCE:PHYSICS/CHEM
PROGRAM TITLE:	CHARGE
TYPE:	SIMULATION
SUBJECT AREA:	PHYSICS
GRADE LEVEL:	SENIOR HIGH SCHOOL
LANGUAGE:	APPLESOFT
PERIPHERAL:	NONE
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	TIES
APPROXIMATE PRICE:	$30.00 U.S. (PER SUBJECT DISK)

DESCRIPTION: This is a physics simulation of the Millikan Oil Drop Experiment designed to demonstrate the existence of a discrete unit of electrical charge. The program allows a student to perform the original experiment without the actual equipment, in much less time, and to isolate the data for drawing inferences.

COMMENTS: Rather dull presentation of this famous experiment.

DISK TITLE:	TIES SCIENCE:PHYSICS/CHEM
PROGRAM TITLE:	WAVES
TYPE:	SIMULATION
SUBJECT AREA:	PHYSICS
GRADE LEVEL:	JUNIOR/SENIOR HIGH
LANGUAGE:	APPLESOFT
PERIPHERAL:	NON
MEMORY REQUIREMENT:	32K
D.O.S.:	3.3
DISTRIBUTOR:	TOTAL INFORMATION EDUCATIONAL SYSTEMS (TIES)
APPROXIMATE PRICE:	$30.00 U.S. (PER SUBJECT DISK)

DESCRIPTION: This high resolution graphics program finds the sum of two waves: one predetermined by the program, and the parameters of the other are controlled by the user.

A set of instructions is included in the program.

COMMENTS: Very attractive program using a high resolution graphics display. An excellent exercise in wave summation. Recommended.

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CHILDREN'S TELEVISION INTERNATIONAL INC.
CHILDREN'S TELEVISION INTERNATIONAL INC.
N/A
15 MINUTES
THIS IS A LOOK AT THE MANY WAYS COMPUTERS CAN SERVE PERSONAL INTERESTS BY EXPANDING THE MENTAL CAPABILITIES OF THE INDIVIDUALS.

THE PRACTICAL GUIDE TO STRUCTURED SYSTEMS DESIGN
MEILIR PAGE-JONES
YOURDON PRESS
$22.50
N/A
THIS PRESENTS METHODS FOR DESIGNING VARIOUS COMPUTER SYSTEMS.

THE RUNNING PRESS GLOSSARY OF COMPUTER TERMS
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RUNNING PRESS
$2.95
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THE STORY OF COMPUTERS (2ND EDITION)
DONALD D. SPENCER
CAMELOT PUBLISHING CO.
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THIS BOOK PRSENTS THE BASIC CONCEPTS OF COMPUTERS.

THE TECHNOLOGY OF COMPUTER MUSIC
MAX MATHEWS
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THIS IS AN EXCELLENT SOURCE BOOK FOR THOSE INTERESTED IN CREATING MUSIC ON THEIR MICROCOMPUTER.

UNDERSTANDING COMPUTERS
PAUL M. CHIRLIAN
DILITHIUM PRESS
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N/A
THIS OFFERS A BASIC OVERVIEW OF THE CONCEPT OF COMPUTER LANGUAGES AND HOW THEY OPERATE WITHIN A COMPUTER.

USING BASIC IN THE CLASSROOM
DONALD D. SPENCER
CAMELOT PUBLISHING CO.
$9.95
224 PAGES
THIS BOOK OFFERS IDEAS ON HOW TO PROVIDE AN INTERESTING AND STIMULATING LESSON IN BASIC PROGRAMMING AT THE HIGH SCHOOL LEVEL.

VIDEO/COMPUTERS
CHARLES J. SIPPL AND FRED DOHL
PRENTICE-HALL/SPECTRUM
$15.95/HARDCOVER $7.95/PAPERBACK
N/A
THIS TEXT EXPLAINS HOW TO MIX, SELECT, AND OPERATE PERSONAL COMPUTERS AND HOME VIDEO SYSTEMS.

VISUAL MASTERS FOR TEACHING ABOUT COMPUTERS
DONALD D. SPENCER
CAMELOT PUBLISHING CO.
$8.95/SET
60 TRANSPARENT FOILS
THESE TRANSPARENCIES PROVIDE AN EXCELLENT AID IN TEACHING A CLASS IN THE BASICS OF COMPUTERS.

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THESE FOILS DESCRIBE THE CONCEPTS OF OF PROBLEM SOLVING IN THE BASIC PROGRAMMING LANGUAGE.

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DONALD D. SPENCER
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THESE FOILS AID THE INSTRUCTOR IN TEACHING THE FUNDAMENTALS OF FORTRAN PROGRAMMING.

WHAT COMPUTERS CAN DO (2ND EDITION)
DONALD D. SPENCER
CAMELOT PUBLISHING CO.
$5.95
128 PAGES
THIS IS A COMPREHENSIVE EXPLANATION OF THE PRACTICAL APPLICATIONS OF THE COMPUTER AND HOW IT AIDS PEOPLE IN THEIR EVERYDAY WORK.

WHAT COMPUTERS CAN'T DO
L. DREYPHUS
HARPER AND ROW
$5.95
N/A
THE AUTHOR ARGUES THAT THE GOALS OF COMPUTER RESEARCH CANNOT BE ATTAINED BECAUSE HUMAN AND COMPUTER METHODS ARE SO DIFFERENT.

WHAT IS A COMPUTER?
MARION J. BALL
HOUTON MIFFLIN CO.
$2.85
N/A
A BOOK ON COMPUTERS FOR CHILDREN.

WHAT MAKES A COMPUTER WORK?
DAN HALACY
LITTLE
$5.95
N/A
A BOOK ON COMPUTERS FOR CHILDREN.

WHY DO YOU NEED A PERSONAL COMPUTER?
LANCE A. LEVENTHAL AND IRVIN STAFFORD
JOHN WILEY
$8.95
N/A
THIS IS A NON USER'S GUIDE TO THE CAPABILITIES AND LIMITATIONS OF COMPUTERS.

WITHOUT ME YOU'RE NOTHING
FRANK HERBERT
SIMON AND SCHUSTER
$14.95
N/A
THIS BEST SELLING SCIENCE FICTION WRTIER ATTEMPTS TO "DEMYSTIFY" THE HOME COMPUTER.

YOU JUST BOUGHT A PERSONAL WHAT?
THOMAS DWYER AND MARGOT CRITCHFIELD
MCGRAW-HILL/BYE
$11.95
N/A
THIS INCLUDES SIXTY READY-TO-USE PROGRAMS FOR EDUCATIONAL GAMES, FINANCIAL RECORD KEEPING, BUSINESS TRANSACTIONS, DISK BASED FILES AND WORD PROCESSING.

YOUR FIRST COMPUTER: A GUIDE TO BUSINESS & PERSONAL COMPUTING
RODNAY ZAKO
SYBEX
$7.95
N/A
THIS IS AN OVERVIEW FOR THE NOVICE THAT COVERS RECENT DEVELOPMENTS IN THE COMPUTER FIELD.

YOUR HOME COMPUTER
JAMES WHITE
DILITHIUM PRESS
$10.95
N/A
THIS IS AN INTRODUCTION TO HOME COMPUTING AND MICROCOMPUTERS FOR NON-ENGINEERS.

jem
research
Joint Educational
Management Research

ANNOTATED BIBLIOGRAPHY
OF
MICROCOMPUTER JOURNALS
MAGAZINES
AND NEWSLETTERS

BY

RON ADAMS

College of New Caledonia
Box 2110
MacKenzie, B.C.
V0J 2C0

ADCIS NEWSLETTER
c/o Computer Centre
Western Washington University
Bellingham, Washington
USA 98225

$40 US membership

The bi-monthly newsletter of the Association for the Development of Computer-based Instructional Systems, one of the oldest and best-organized groups of post-secondary computer-using educators. It has separate special-interest groups for those developing software for health education, home economics, mathematics, music, PLATO, elementary and secondary schools, computer-based training, and the handicapped. It hosts one of the most important computers-in-education conferences each year and publishes the quarterly Journal of Computer-Based Instruction of scholarly articles in the field.

APPLE EDUCATION NEWS
Box 20485
San Jose
California
USA 95160

Free

The Apple Corporation's occasional newsletter is a useful source of information on the burgeoning Apple-based CAI programs being developed in US universities, colleges, and schools. It also contains the inevitable glowing accounts of the company's educational software as well as software being developed for the Apple by other companies. The newsletter is evidently intended for distribution in computer stores because there is no subscription information in the September 1980 issue. I've written the editor and requested a free subscription. Recommended.

APPLE EDUCATORS' NEWSLETTER
9525 Lucerne Street
Ventura, California
USA 93004

$12 US

The bi-monthly newsletter of Apple for the Teacher group a California-based organization of elementary and high school teachers dedicated to sharing information and developing educational software for the Apple. It's a good source of software reviews and information on CAI projects that don't get coverage in the glossy magazines. Recommended.

APPLE MAGAZINE
10260 Bandley Drive
Cupertino, California
USA 95014

Free

The Apple corporation's quarterly catalogue disguised as a magazine. It contains several short articles lauding the Apple's versatility as a personal and small business computer plus an up-to-date listing of all hardware and software marketed by the company. It's available at Apple dealers and usually distributed free to potential customers.

APPLEGRAM
Apples B.C. Computer Society
#101-2044 West Third Avenue
Vancouver, B.C.
V6J 1L5

$15 membership

The quarterly newsletter of the Apple's B.C. Computer Society, a group that includes several of the province's top microcomputer programmers. The newsletter contains software reviews, program listings, short articles on technical topics, buy and sell advertisements, club notices, and a list of programs that members have contributed to a software library that can be purchased for $10 a disk.

BYTE
Box 590
Martinsville, NJ
USA 08836

$21

Byte is McGraw Hill's monthly attempt to imitate the worst features of Scientific American and the Sears Catologue. The articles are highly technical and frequently devoted to arcane subjects that will bewilder the small systems user that the magazine is supposed to serve. Interesting material is buried in a blizzard of advertising. But it's the leading microcomputer journal and will keep you abreast of the latest developments in the field not to mention all the new hardware. I buy it for two columns: Bytelines, which is Sol Libes' fascinating analysis of news and rumours in the microcomputing industry, and the Education Forum, which reports CAI projects at various US universities and colleges.

CANADIAN DATASYSTEMS
Box 444, Station A
Toronto, Ontario
M5W 1C2

$15

A relatively inexpensive way to keep track of technical developments in the Canadian data processing field.

CATC DIGEST
Educational Testing Service
Princeton, NJ
USA 08540

Free

A succinct but academic four-page quarterly newsletter on computer-assisted test construction on large computer systems.

CLASSROOM COMPUTER NEWS
Box 266
Cambridge, Mass
USA 02138

$9 US

The complimentary issue that I received contained the following articles: Computer-Literacy--What Should Schools be Doing about it; A School Administrator Looks at Visicalc; Special Tools for Special Needs; Programming I--The Starting Gate; Word Processors for Teachers; Microcomputers in the School Library's Future; and How Does the Computer Remember All that Stuff? Need I Say more?

COMPUTE!
Box 5406
Greensboro, NC
USA 27403

$18 US

One of the few magazines that carries separate sections on the Atari, OSI, PET, and single-board microcomputers (AIM, KYM, SYM). It contains regular columns on the social impact of microcomputers, applications for the handicapped, and BASIC programming tips, together with a selection of reviews and printed programs for the Apple user. The bulk of Compute!, however, is devoted to other microcomputers.

COMPUTER AGE
4 Valentine Place
London, SE1
Great Britain

34.20 pounds

This British monthly, is in my opinion, the leading microcomputer journal in the English language. It is comprehensive, well laid out, and written in a brisk, erudite, jargon-free style that ordinary mortals can understand. Topics discussed in recent issues include the office of the future, computer literacy, computer-assisted instruction, ergonomics, voice synthesis, the use of microcomputers in medicine and special education, bubble memory, artificial intelligence, to name but a few. The magazine has also been featuring excellent tutorials in programming languages like PILOT, FORTH, and APL. There's only one problem: the subscription price is 7.20 pounds which is $20 and very reasonable, but the British Post Office charges a King's ransom to airmail it to Canada--27 pounds--which brings the cost to nearly $100 per year. No magazine is worth that much.

COMPUTERTOWN USA!
Box E
Menlo Park
California
USA 94025

Donations

The monthly newsletter of a group of enthusiasts dedicated to promoting computer literacy in Menlo Park, California. Their projects include microcomputer fairs, programming contests, and public demonstrations as well as the installation of microcomputers in public libraries. It's a good source of ideas on grass-roots microcomputer uses.

COMPUTERWORLD
375 Cochituate Road
Box 880
Framingham, Mass
USA 01701

$65

Computerworld describes itself as "The Newsweekly for the computer community", which is to say the programmers, analysts, specialists, data processing executives, and computer centre directors who cope with the big, expensive, and soon-to-be obsolete mini and megacomputer systems. The articles, reports, and reviews are fascinating if obscure, but the job classifieds are truly spectacular.

COMPUTING TEACHER, THE
Computing Centre
Eastern Oregon State College
La Grande, Oregon
USA 97850

$15 US

Edited by one of the leading CAI educators, David Moursund, this journal focuses on teacher education, computer-assisted instruction, and the impact of computers on curriculum. Apart from the usual articles and software reviews, _The Computing Teacher_ features reports on CAI projects, articles on instructional design, and an assortment of calculator and microcomputer programming assignments that can be adapted for classroom use. No microcomputer-using teacher should be without it.

CREATIVE COMPUTING
Box 789-M
Morristown, New Jersey
USA 07960

$24 US

If you plan to purchase only one microcomputer magazine, this is it. It has all the articles, reviews, program listings, and columns of the other general microcomputer monthlies plus a sense of humour: it's sprinkled with cartoons, delightful pen-and-ink drawings, satirical pieces, short stories, puzzles, and even the occasional poem. Morever, it's not limited to computer topics. Recent issues contain an excellent series on effective writing techniques that any writer can use. Don't miss an issue.

CUE NEWSLETTER
Independence High School
1776 Educational Park Drive
San Jose
California
USA 95133

$4 US

The bi-monthly newsletter of California's Computer Using Educators, an enthusiastic group of several hundred elementary and high school teachers who have just started an educational software exchange. The newsletter outlines their many activities and prints short but revealing software reviews from a teachers' point of view. It provides a model for CUE groups and is well worth the modest subscription price.

DATAMATION
1301 South Grove Avenue
Barrington, Illinois
USA 60010

$45

Up-to-date coverage of hardware developments in the $100,000 range that will make microcomputer enthusiasts drool. Check out a library copy from time to time.

ECOO NEWSLETTER
Box 1015
Station B
Toronto, Ontario
M5T 2T9

$10 membership

The lively quarterly newsletter of the Educational Computing Organization of Ontario, a group of OISE-based educators dedicated to promoting computer literacy and computer-assisted instruction in Ontario schools. They've given Ontario a year's lead over other provinces like B.C. that are flirting with microcomputers in the schools. Unlike B.C., however, the Ontario ministry of education has not had the forsight to select a province-wide system.

ILLINOIS SERIES ON THE EDUCATIONAL APPLICATION OF COMPUTERS
Department of Secondary Education
College of Education
University of Illinois
Urbana, Illinois
USA 61801

A series of academic papers "prepared as resources for the preservice and inservice training of teachers (under) the general theme of teaching with or about computers". I'm not sufficiently well informed in the teacher-training field to evaluate this comprehensive series. Some of the material may be dated, but it will doubtlessly be very useful to department of education faculty interested in adding computer-assisted instructional technology to their curriculums. I've misplaced the price information but recall that it was modest.

INFOSYSTEMS
Hitchcock Publishing Company
Box 3307
Wheaton, Illinois
USA 60187

$40 US

An expensive monthly aimed at information systems executives. Apart from the glimpse it gives into the career potential of computer professionals, it isn't much use to beginners or educators.

INFOWORLD
Circulation Department
375 Cochituate Road
Framingham, Mass
USA 01701

$35

A twice-monthly newspaper aimed at the personal and business microcomputer user that will keep you informed of the latest developments and uses in the industry. The coverage is comprehensive and most articles are jargon free. Particularly valuable are its editorials, its many candid software reviews, and its job classifieds, which will quickly convince you that you're in the wrong line of work. Recommended.

INTERFACE AGE
Box 1234
Cerritos, California
USA 90701

$28 US

An expensive monthly that features one microcomputer system each month together with articles, software reviews, and regular columns on do-it-yourself projects, games, mathematics, and free literature. Program listings are rarely compatible with the Apple. Take out a subscription

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only if you've got Computer Age, Creative Computing, and a dishwasher.

IRQ NEWSLETTER
c/o Harold Brochman
3264 St. Georges Avenue
North Vancouver, B.C.
V7N 1V3

$10 membership

The monthly newsletter of the BCTF's new Computer-Using Educator's Association of B.C. (CUEABC). It will keep you up to date on B.C. Teacher's use of microcomputers and merits your support.

ITMA NEWSLETTER
College of St. Mark and St. John
Derriford Road
Plymouth, PL6 8BH
GREAT BRITAIN

Free, but send 10 pounds for back issues and postage

The quarterly newsletter of the British Investigations on Teaching with Microcomputers as an Aid project, a rapidly growing group of British teachers dedicated to developing, evaluating, and promoting CAI materials. It features valuable material on CAI techniques and applications articles written by teachers. It contains programming tips and 380Z BASIC program listings that an adept machine-language programmer will be able to convert to Applesoft. (Please send them to me if you manage it.) The newsletter furnishes ample proof of Britain's lead in the educational applications of microcomputers.

JOURNAL OF COMPUTER-BASED INSTRUCTION
Computer Centre
Western Washington University
Bellingham, Washington
USA 98225

$12 US
Free to ADCIS members

The JCBI is the academic quarterly of the university of Western Washington's Association for the Development of Computer-Based Instructional Systems. The people responsible for putting it out assert that it "publishes original investigations and theoretical papers dealing with direct applications of computing to the problems of learning and instruction, design of curriculum, authoring languages and systems, and comparative curriculum structures for computer-based instruction". Contributors are urged to submit "empirical studies that use experimental procedures which will maximize the potential generalizability of outcomes. Enough said.

MICRO
Box 6502
Chelmsford, MA
USA 01924

$18 US

A monthly for experienced Apple, PET, OSI, and KYM/SYM/AIM Programmers. Each issue contains one or more useful utility program for the Apple, but most of the coverage is devoted to the other microcomputers. However, it does have two features that make it worth the subscription price: a monthly annotated bibliography of articles in the many obscure microcomputer journals not reviewed here and a directory of new software.

MICROCOMPUTING
POB 997
Farmingdale, NY
USA 11737

$27 US

A comprehensive magazine on microcomputing noted for excellent articles on technical topics as well as for regular features on the industry, educational projects, new products, and book reviews. Editor Wayne Green's trenchant monthly analysis of the microcomputer industry is worth the price of the magazine. Recommended.

MICRO-SCOPE
JEM Research
Discovery Park
The University of Victoria
Box 1700
Victoria, B.C.
V8W 2Y2

$10

The newsletter of the Joint Educational Management Research project, the consultants responsible for the Ministry of Education's microcomputer pilot project, will keep you abreast of the rapidly growing use of computer-assisted instructional materials in B.C.'s elementary and high schools.

MINI-MICRO SYSTEMS
Box 5051
Denver, Colorado
USA 80217

$65 US

A glossy monthly specializing in minicomputer hardware. It is aimed at engineers, consultants, systems specialists, and data communications management personnel. The articles are larded with technical jargon. Purchase the occasional copy if you're interested in the dazzling array of hardware available to big business users; otherwise, this expensive journal can be safely ignored unless you're a high-paid specialist entitled to a free subscription.

NIBBLE
Box 325
Lincoln, MA
USA 01773

$22.50 US

NIBBLE is a bi-monthly magazine dedicated to Apple users. It is geared to programmers. Each issue features at least two major program listings for home or small business or entertainment use that can be typed into the Apple. It also contains a selection of programming tips, hardware construction projects, and product reviews. The major listings may also be obtained on diskettes for $15 or less. People who enjoy programming swear by it and no Apple owner should be without a subscription. Highly recommended.

ONCOMPUTING
70 Main Street
Peterborough, NH
USA 03458

$10 US

McGraw Hill's quarterly is aimed at the new microcomputer owner. It contains easy-to-read reviews and articles on microcomputers, peripheral devices, software, and new products, all of which are lavishly illustrated with colour photographs and diagrams. It's a useful reference and well worth the price of a subscription.

PERSONAL COMPUTERS
1 Fawcett Place
Greenwich, Conn
USA 06830

$1.75 issue

Mechanix Illustrated's quarterly magazine on microcomputers. It is designed for newsstand sale - no subscription information was provided in the first two issues - and the articles and product reviews are brief, easy-to-read, and rather superficial. It won't impress anyone with a modicum of microcomputer experience, but it's a useful introduction for the beginner.

PERSONAL COMPUTING
Circulation Department
1050 Commonwealth Avenue
Boston, Mass
USA 02215

$22 US

A monthly containing articles on a variety of topics and regular columns on computer chess, computer bridge, and the future of computing. It is biased toward the TRS-80 and is not high on our recommended list for Apple owners.

PIPELINE
CONDUIT
Box 388
Iowa City
Iowa
USA 52244

$25 US (membership)

A semi-annual report of the University of Iowa's CONDUIT organization, a US government-supported project designed to develop, evaluate, and market computer-assisted instructional materials for higher education. Members of CONDUIT receive Pipeline, a CAI authoring guide, and brochures on new post-secondary CAI materials, some of which are available for the Apple. Pipeline contains several short articles on CAI research as well as a catalogue of $50 disk-based programs in biology, chemistry, economics, education, geography, psychology, sociology, humanities, management, mathematics, physics, political science, and statistics. Recommended.

PURSER'S MAGAZINE
Box 466
El Dorado, California
USA 95623

$12 US

A computer-printed, privately published, no-holds-barred quarterly collection of business, educational, and games software reviews. The magazine accepts no advertising, so if the program is a dog - and a great many are - Purser reports it bluntly. This extraordinary one-man publication may be in trouble: subscribers recently (April 1981) received a postcard urging them to have a little more patience for the long-overdue first issue of 1981. Recommended for the owners of all microcomputers except PETs, which Purser shuns for reasons that are not yet clear to me.

RECREATIONAL COMPUTING
P.O. Box E
Menlo Park
California
USA 94025

$20 US

A brief but excellent bi-monthly magazine published by the People's Computer Company, an organization created in 1972 by enthusiasts dedicated to taking computing to the people. It contains concise articles on the use of microcomputers in education, medicine, music, and the home as well as regular columns on programming techniques, programming problems, and games. It is not overwhelmed with glossy advertising, and each issue contains program listings that can be typed into the microcomputer. Recommended.

SCIENTIFIC AMERICAN
Box 5919
New York, NY
USA 10017

$21

The leading scientific monthly occasionally publishes highly technical but well illustrated articles on microelectronics that are worth searching out. Silicon chip technology is thoroughly explained in the issues of May 1975 and September 1977; the superconducting Josephson Junction is featured in May 1980; and disk storage technology is described in August 1980.

SOFTSIDE
Box 68
Milford, New Hampshire
USA 03055

$25 US

A monthly devoted largely to printed games software for the APPLE, PET, TRS-80, and ATARI microcomputers. It also contains tips for advanced programmers.

T.H.E. JOURNAL
Box 992
Acton, Maryland
USA 01720

$20 US

A bi-monthly journal subtitled Technological Horizons in Education published for school administrators by Information Synergy Inc. of Acton, Maryland. It contains short reviews of new equipment plus five or six erudite articles on the theoretical and practical applications of technological innovations in education ranging from basic literacy to university training. Complimentary subscriptions are available to senior administrators. I recommend it highly for educational planners and graduate students in education.

A SELECTED LIST OF COMPATIBLE ACCESSORIES AND EXPANSION OPTIONS FOR THE APPLE II

1. Mountain Hardware's Supertalker is a speech input-output board for the Apple computer. It plugs into any I/O slot and connects with an ordinary external speaker and a microphone. The supertalker converts speech into binary and binary back into digitized speech. It comes with two ready-to-run programs: ACCENT, a talking language translator, and TALKING COLOR MATH, a talking arithmetic game, illustrating program uses. The VPS, Vocal Preparation System, shows the user how to create talking programs. Teacher chosen phrases can be input for later voice output in custom lessons for Language Arts and foreign language vocal drills, approximately $400.00.

   The Supertalker SD200 stores 100% more speech information on a single diskette and provides 100% faster transfer of words or phrases off disk than the Supertalker. It also comes with two more programs, LISTEN'N'LEARN, exercises in the Language Arts, and SPELLING TEST, a tutorial that illustrates how to create talking programs.

2. Apple Computer Graphics Tablet allows the user to convert graphic data into digital information that may be processed by the Apple Computer System. Shapes traced or drawn freehand on the tablet surface are instantly displayed on the system monitor. Once created, an image may be stored on the system disk for later retrieval and modification.

   The Tablet system consists of 15-1/2" x 15-1/2" tablet (11" x 11" active surface area), a mylar overlay stylus, diskette software interface and documentation. Applesoft BASIC, 48K and a disk drive with controller are required, approximately $1,000.00.

3. Versawriter Inc. Drawing Tablet allows the user to create and display high resolution pictures in over

100 colours, create freehand shapes for shapetables, add text to high resolution displays, create schematic drawings etc. The system requirements are ROM Applesoft, 48K of memory, and a disk drive. Price is approximately $250.00 (U.S.).

4. The Chatsworth MR-500 mark sense card reader allows the user to enter data into the Apple by marking a card with a standard #2 pencil. The user programs the card by marking with the pencil; the card is fed into the reader slot; the reader automatically turns on; the card is fed through; and the data is entered into memory, approximately $750.00 U.S. The Chatsworth #4300 can read up to 300 cards a minute and is capable of reading punched, pencil marked, preprinted on variable sized cards, approximately $5,200.00.

5. Microphase Software Test Analysis System operates in conjunction with a Scantron test scoring data terminal to determine raw scores, percentiles, scale scores and grade level equivalents. The system requirements are an 80-column printer, two disk drives and a language card. Approximate price for both Scantron terminal and software is $3,600.00 (U.S.).

6. Mountain Hardware Clock Board keeps accurate time; is useful for logging data and time on listing and in programs; measures elapsed time, time intervals and control interrupts on a real-time basis; and has battery back-up. It comes with complete instructions in a forty page manual, approximately $225.00 U.S.

7. Printer II from Centronics is a compact, desk-top printer which prints 80 characters per line at 150 lines per minute. It produces 5 x 7 dot-matrix characters at 5, 10 or 20 characters per inch. It prints the full 96 character ASCII set, including lower case letters. It is quiet and prints on 4.65" aluminum-coated roll stock. The printer is supplied with a Parallel Printer Interface Card, all necessary cables and connectors, and operating documentation,

approximately $700.00.

8. Printer IIA from Centronics is a medium-speed impact printer for home and business applications requiring low cost, multi-copying printing. It prints 132 (5 x 7) dot-matrix characters per line, at 60 characters per second. It reproduces the 64 character, upper-case ASCII set; it has a tractor paper feed which allows printing of five part forms in widths to 9.8". It comes with a Parallel Printer Interface Card, all necessary cables and connectors, and operating documentation, approximately $1,500.00 U.S.

9. Silentype Thermal Printer is a quiet, versatile and compact thermal graphics printer. Upper and lower case text is printed at up to 40 characters per second, 80 characters per line and high resolution graphics are printed at 60 dots per inch. The Silentype prints on white paper that is available in easy to use 80 ft. rolls. Because it receives its power and intelligence from the Apple, it can be programmed to do such functions as changing margins and line spacing. The printer comes with an Interface Card, a roll of paper, an Operation and Reference Manual, and a warranty card, approximately $600.00 U.S.

10. The Paper Tiger Printer gives the user eight software selectable character sizes and 80 and 132 column formats. It has a step-motor paper drive and adjustable width tractor feed. With the DotPlot option and software drivers, the user can print screen graphics, draw illustrations, write block letters and plot charts. Approximately $1,500.00.

11. The Anadex DP 9501 dot-matrix impact printer provides four print densities, prints bidirectionally with a maximum 220 characters per line, provides true high resolution graphics with a resolution of 72 x 75 dots per inch, and comes with a 79 page operator's manual. Approximate price is $1,595.00 (U.S.).

12. The Epson MX-80 impact printer provides 96 ASCII and 64 graphics characters in a 9 x 9 dot matrix, prints bidirectionally at 80 cps, supports TRS-80 graphics characters, Japanese Katakana characters and special European characters. Three print densities are available and a maximum of 132 characters per line can be printed. Approximate price is $650.00 (U.S.).

13. The Epson MX-70 produces characters on a 7 x 5 dot matrix at 80 cps, printing is unidirectional and high resolution (480 x792 dots) graphics picture displays are possible. The unit comes with either U.S/Japan or English/German special character sets. Approximate price is $450.00 (U.S.).

14. The SpinWriter 5510/5515 letter quality impact printer produces characters via an interchangeable font-thimble at 55 cps. Printing is unidirectional and 136-163 columns per line are selectable. The feed mechanism is friction/tractor and the approximate price is $2,995.00 (U.S.).

requires amplifier

15. The Alf Music Sythesizer can be plugged into any Apple expansion slot to explore the possibilities of computer-controlled music. The single circuit card contains three channels so that 1, 2, or 3 units can be used for 3, 6 or 9 voices. Stereo is available when using 2 or 3 units, and the synthesizer offers 8 octaves with 24 notes per octave. The music entry program uses game paddles to position notes on the musical staff which is displyed on the high resolution screen using the traditional sheet music format. The software provided with the unit allows control of slides, vibrations, pulse widths and other effects. In music education where composition, score writing, pitch, interval recognition, music appreciation,and entertainment are involved, the synthesizer would be a very useful tool. Approximately $300.00 U.S.

16. The MicroMusic Inc. music card allows both graphic and algebraic music entry, plays up to four simultaneous voices, allows a choice of seven preset tone colours or unique user-created tone colours, and standard musical notation may be displayed as the music is played. The unit has a built-in amplifier, so the user need only provide an 8-ohm speaker. Approximate U.S. price is $205.00.

fsh = f# ½ note

17. American Micro Products, Inc. Music Board allows the user to compose, edit and store music containing up to three simultaneous voices. Six boards may be installed, thus providing 18 voices. Each board contains a white noise generator. Approximate U.S. price is $130.00.

18. Mountain Hardware MusicSystem allows graphic input of sheet music using a light pen, game paddles or keyboard. Sixteen voices (eight in stereo) are supported and waveforms, envelopes and amplitudes are individually programmable for each of the sixteen voices. Approximate price is $700.00.

19. The Apple Language System allows Apple users to take advantage of Pascal as well as Integer and Applesoft BASIC Interpreters. It does this by means of the Language Card which provides 16K bytes of RAM memory that electrically replace the ROM firmware built into each Apple. It gives both Apple II and Apple II Plus owners access to all available languages which are automatically loaded from disk with the user's choice of language and then protected from change. Approximately $575.00.

20. The Applesoft Firmware Card provides access to the library of programs written in this extended BASIC language. It contains hardware and software controls that allow it to electrically replace the existing Integer BASIC firmware in Apple II computers. The firmware card comes with Auto-start monitor ROM and Applesoft II Reference Manual, approximately $225.00.

21. The Integer BASIC Firmware Card provides access to a library of programs written in the Integer BASIC language. It contains hardware and software controls and allows it to electrically replace the existing Applesoft BASIC firmware in Apple II Plus computers. The firmware card comes with a BASIC Programming Manual; Apple II monitor ROM; Programmer's Aid #1 ROM; and Programmer's Aid #1 Installation and Operation Manual, approximately $225.00.

22. The ROMPLUS + board is a programmer's aid which adds a number of features to the Apple, including: 1)upper and lower case letters; 2)multiple user-defined character sets; 3)coloured or invers-coloured letters; 4)mixed text and graphics; 5)improved cursor control; 6)STOP LIST and END LIST; and 7)keyboard macros. It will work with Integer BASIC, RAM or ROM Applesoft and DOS. It comes with software support provided on diskette. Approximately $200.00.

23. Mountain Hardware SUPERTALKER SD 200 $545.00 - $465.00 (Federal Duty and Sales Tax Not Included) permits computer talking programs and interactive teaching programs as well as speech-prompted data input formats. Controlled by special software operating system. Teacher chosen phrases can be input for later voice output in custom lessons for language arts and foreign language vocabulary drills. Includes Super Talker Firmware, microphone, ready-to-run programs, documentation.

24. Symtec LIGHT PEN $365.00 - $310.00 (Federal Duty and Sales Tax Not Included). When pointed at the video monitor, the Light Pen and interface card detect the scanning light beam. This allows computer identification of objects, areas or locations on the screen. This frees the user from the keyboard but permits input of commands, answers or responses. Able to resolve over 50,000 screen locations making production of diagrams and pictures on the display

monitor. Includes Pen, interface card, software and manual.

25. Microsoft Z-80 Softcard allows the Apple to become a Z-80 microprocessor machine running under the CP/M operating system. In this fashion the large library of Z-80 software is available to run on the Apple. Microsoft 5.0 BASIC is provided with the card and FORTRAN, COBOL, a BASIC compiler and an Assembly Language Development System are available separately. Approximate U.S. price is $350.00.

26. M & R Enterprises SUP'R'TERMINAL interface card allows the Apple to display 80 columns by 24 lines in both upper and lower case, using all 128 ASCII characters. All BASIC and Pascal control characters and monitor escapes are supported, and the board is compatible with all APPLE II peripherals. Approximate Canadian price is $499.00.

27. Heuristics Speechlab is a plug-in module allowing the Apple II to recognize a spoken vocabulary of up to 32 user selected words. The computer can be programmed to perform any task desired upon recognition of a key word. Its potential uses include applications in scientific research, in education for the physically handicapped. The Voice Recognition Unit comes as a plug-in card with a microphone and complete documentation. Heuristics Speechlink allows the Apple to recognize spoken vocabulary of up to 64 user selected words. Approximate Canadian price is $289.00 (Speechlab), $389.00 (Speechlink).

28. Modem IIA is an accoustic couplex which links the Apple II through he Communications Interface Card to the telephone network and timesharing services. It operates in either the Originate or Answer modes. To connect with the phone system, the telephone handset is placed in position on top of the modem. No wiring changes are required. Modem IIA comes with a Communications Interface Card, demonstration tape, all

required cables and complete documentation. Approximately $500.00 with Interface, $265.00 without.

29. Heuristics Inc. Voice Controller system provides the user with voice communication to the Apple. A 64 word/phrase vocabulary is supported, with 99%+ recognition accuracy. Rejection level of non-recognized words/phrases can be set by the user. Includes a high-quality noise cancelling microphone, and is also available with a 128 word/phrase vocabulary option. U.S. list price is $3,300.00

30. Microproducts Apple II EPROM in conjunction with the 6502 Development System and the EPROM Programmer allow the user to develop 6502 assembly language code and store it as firmware on the card. U.S. list price of the three items in the package totals to $325.00.

31. The Cavri III interactive videotape system allows the user to integrate the Apple with a Panasonic, Sony or JVC videotape machine. An authoring system on diskette, as well as a documentation manual both accompany the interface card. The complete package sells for $695.00 Canadian.

32. The Corvus Systems, Inc. CONSTELLATION network provides for a multi-station timesharing system in which a Z-80 based host multiplexer polls up to eight microcomputers in round robin fashion. Up to eight such host multiplexers may be interconnected so as to support a total network capacity of 64 microcomputers. A minimum system would require one hard disk system ($5,350.00), a host multiplexer ($750.00), and one interface card for each microcomputer which is part of the system ($220.00 each). Various manuals, cables and archival storage systems are available at extra cost, all prices are approx. and U.S.

33. The JEM Video Interface Card will allow Sony Betamax (models SLO-320. SLO-323) or Panasonic (models NV8170. NV8200) video cassette players to be coupled to an Apple computer, so that a low cost. lecture supplemented, computer aided instructional system is achieved. The viewer is asked questions about the video material and responses can be stored and evaluated. Sections of the tape can be chosen for viewing, skipping over the unwanted material. The system combines the best features of video presentation and computer interaction to create an environment of special personalized instruction. The card is accompanied by software or diskette to facilitate use in lesson development. Price $500.00 (Canadian).

34. The JEM Science Kit consists of an analog to digital conversion interface card, a temperature probe. two diskettes and complete documentation. The probe will record temperature data over a -50 degrees C to + 150 degrees C range, with an accuracy of 0.5 degrees C and a resolution of 0.1 degrees C. The software enables the user to plot high resolution temperature curves. and store the temperature data and graphs on diskette. The user may rescale data and "zoom in" to closely examine temperature gradients. Curve smoothing algorithms may be invoked to remove transient "spikes" and thus generate a more attractive graph.

Add-on hardware items, along with the appropriate software. are under development for the interface card. In this fashion, the user will be able to also interactively record and plot such parameters as voltage. pH. conductivity. salinity. light intensity. etc. Price $125.00.